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COMPUTERWORLD

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Instant management: A 90-day deadline to exit Polaroid's market helped prepare Katherine Hudson to become Kodak's first chief of centralized MIS. Page 77.

Apple suit fails to shatter Windows force

BY ED SCANNELL
CW STAFF

Software developers were almost unanimous last week in their pledges to continue developing applications for IBM's Presentation Manager despite the threat posed by the suit Apple Computer, Inc. has brought against Microsoft Corp. and Hewlett-Packard Co.

Developers took their positions at the same time that IBM and Microsoft were acting quickly to calm fears that the suit would slow work on the Presentation Manager and Microsoft Windows.

"The suit doesn't have any merit in our evaluation of it," said Bill Gates, chairman of Microsoft. "We're certainly not changing anything we're doing. It's hard for us to understand what Apple's thinking."

Microsoft's Bill Gates

"We're continuing to work on the Presentation Manager," said William P. Lyons, IBM's general manager of personal systems merchandising. "We plan to keep October as our [ship] date, and it's all systems go, as far as we're concerned." Lyons declined to comment on the specifics of the suit.

Microsoft eased the anxieties of third-party developers by sending out hundreds of electronic mail memos and letters assuring them that Windows development will continue.

Speaking at a meeting of the Boston Computer Society last week, William C. Lowe, president of IBM's Entry Systems Division, further calmed developers, saying that all work done on the Presentation Manager by IBM and Microsoft is based on the original work of the two companies. "My anticipation is that our products will be free of any accusations," Lowe said.

Inside

• Impact examined: raves for New Wave; legal issues cloudy. Pages 6, 7, 35, 83.

Borland International was the only major developer to change its planned development course

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HP Spectrum winning fans at first sites

BY JAMES A. MARTIN
CW STAFF

Early users of Hewlett-Packard Co.'s long-delayed Spectrum series of superminicomputers say they are pleased with the fast performance and uncomplicated migration path from lower end HP 3000 models.

However, they warn, be wary of unexpected software upgrade fees and peripheral incompatibilities.

MIS managers interviewed by *Computerworld* said converting from the HP 3000 Series 70 — the previous high end of the line — to the Spectrum Models 930 and 950 is, as HP promised, a relatively smooth process. They said many applications run four times faster on the Spectrum systems.

"I've been associated with many conversions before where you had to rewrite 90% of your code to go from an IBM System/36 to a System/38 or to a 4381 mainframe. Moving from the 70 to the 950 is the easiest conversion I've ever made," said Terry Reffner, information systems specialist for General Electric Co.'s Erie, Pa., division.

In addition, users said, Spectrum processing speeds are often four or five times faster than those of the Series 70.

"Some batch jobs that used to take half an hour on the Series 70 now take five minutes on the Model 930," said Jeff Pour, section manager at the Human Re-

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Lotus fumbles upgrade

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — To the chagrin of eager customers and the delight of its spreadsheet rivals, Lotus Development Corp. revealed last week that the shipment date of its long-awaited upgrade of 1-2-3 has been pushed back six months, placing it at the end of the year.

While the news sparked a sell-off of Lotus stock on Wall Street, Lotus customers expressed little concern about the delays, saying their investment in training and support is too great to warrant a switch to a competitor.

The six-month delay for 1-2-3 Release 3 may also postpone the release of critical products that Lotus revealed during last year's parade of preannouncements, including 1-2-3 for Apple Comput-

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TURNING POINT

Cullinet braces for battle of its life

BY NELL MARGOLIS
and ROSEMARY HAMILTON
CW STAFF

WESTWOOD, Mass. — Cullinet Software, Inc. has invested $100 million, five acquisitions and close to two years in an all-out effort to transform a beleaguered mainframe data base vendor into a triple-threat software house.

How wisely the company spent its money and time will begin to show next week, as Cullinet christens the flagship of its Digital Equipment Corp. VAX-based product line, IDMS/SQL, a transaction-processing relational data base management system.

To date, Cullinet's fortunes have been dogged by a string of seven losing quarters. Reversing that trend depends on Cullinet's gamble that it can quickly diversify its product line at the expense of short-term profits. For that gamble to pay off, the products set for introduction next week and during the

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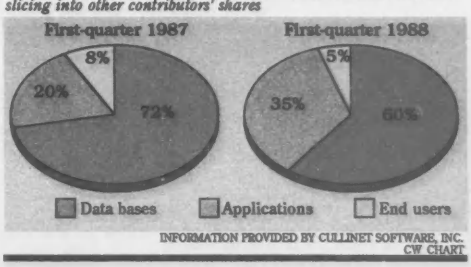
Cullinet product mix changes

Applications make up bigger piece of company revenue this year, slicing into other contributors' shares



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Room with wheels

Consortium plans hotel/car reservation system

BY ALAN ALPER
CW STAFF

NEW YORK — AMR Information Services has joined with three travel services companies to design a mainframe-based system to handle hotel and automobile rental reservations.

The information services affiliate of American Airlines and partners Hilton Hotels Corp., Marriott Corp. and Budget Rent-A-Car Corp. said they are in the final six months of the design phase of the project. Once the design is completed, the partners will decide whether the system, called Confirm, should be developed. If all goes well, Confirm should go on-line in early 1990, the partners said.

Once implemented, the companies said, Confirm will provide features not currently available in car and hotel reservation systems, such as instant reservation confirmation, up-to-the-minute tracking of room and car availability and the ability to handle special promotional programs for participating firms.

Interfaces to other airline reservation systems, such as American Airlines' Sabre, will also be provided, company spokesmen said.

The advantage Confirm offers over other systems is one-stop shopping for independent agents and corporations making travel plans, the participants said. Travel and hotel reservation agents will also be able to access Confirm via their current workstations.

Confirm is expected to run on large-scale IBM mainframes running IBM's TPF, according to Nick Bredimus, president of AMR Travel Services, a division of AMR Information Services. An IBM SQL-compatible fourth-generation language and database management system will be used to develop a decision support component for ad hoc queries and report generation, Bredimus added.

Much of the development work will be conducted at Compass Computer Services, Inc., a Dallas company jointly owned by Hilton and Budget that previously developed a hotel and car rental reservation system. That system, called Compass, will be operated by AMR Travel Services until Confirm goes on-line. Compass Computer Services will merge with the AMR Information Services division once the design phase of Confirm is completed, spokesmen said.

A minimum of $60 million is expected to be spent by the time development is completed, according to Russell Harrison, president of AMR Information Services.

HP follows Ardent, Stellar into super workstation waters

BY JULIE PITTA
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. launched its entry in the embryonic supercomputing workstation market last week with its HP 9000 Models 835 and 350 TurboSRX.

As part of HP's Precision Architecture systems based on reduced instruction set computing (RISC), the workstations use the 14 million instructions per second (MIPS) Model 835 computational engine, offering performance of 2.02 million floating-point operations per second in a single-user environment. Added is the TurboSRX, a graphics engine that enables three-dimensional graphics and imaging.

According to HP, performance for the graphics subsystem has been measured at 900,000 transformations per second; 240,000 3-D vectors per second; and 50,000 clipped, checked, 50-pixel triangles per second with Z-buffer and Gouraud shading.

The graphics subsystem has also been added to HP's Model 350, a Motorola, Inc. 68020-based workstation offering 4 MIPS performance. The Model 835 TurboSRX costs $91,500; the Model 350 TurboSRX costs $70,000. They should become available after April 1.

Applications developed for HP's earlier Models 835SRX and 350SRX workstations can be ported to the new systems without modification, according to HP. Both the Model 835 TurboSRX and the 350 TurboSRX run HP-UX, HP's version of the Unix operating system.

Brad Smith, an industry analyst at Dataquest, Inc., said the workstations make HP the latest player in the graphics supercomputer market, established just last month by introductions from Stellar Computer, Inc., Ardent Computer Corp. and Apollo Computer, Inc. "It's their show at the Stellar and Ardent arena," he said, adding that he expects Sun Microsystems, Inc. to enter the market and Apollo to add more complex graphics capabilities to its system.

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IBM's Pactel Spectrum buy-out to boost Netview

BY PATRICIA KEEFE
CW STAFF

ARMONK, N.Y. — IBM's Netview network management system took a step closer to full support of non-Systems Network Architecture (SNA) devices with IBM's purchase last week of Pactel Spectrum Services.

An unregulated subsidiary of Pacific Telesis Group, Pactel Spectrum provides services for isolating failures between customers' communications equipment and the interconnecting telecommunications facilities by placing remote testing equipment at customer sites.

"We do plan to tie together Netview and Spectrum capabilities," an IBM spokesman confirmed, but he could not provide a timetable. "This will expand IBM's network management capabilities to pinpoint problems with additional non-SNA devices and associated communications lines," an IBM executive said in a prepared statement.

Under the terms of the agreement, IBM has acquired the technical and operational assets of Pactel Spectrum for cash. The purchase price was not disclosed, although industry estimates ran as high as $75 million.

Layoffs possible

The transaction is expected to be final within 30 days, and IBM said it will offer positions to about 80 of Pactel Spectrum's approximately 125 employees. Those employees, along with Spectrum's services, will be folded into a division under the National Services Division.

IBM also inherits Spectrum's customer base, which observers place at between 25 and 50 midsize companies. Pactel Spectrum had initially targeted the top 200 corporate customers, said Clare Fleig, research director for International Technology Group in Los Altos, Calif.

IBM is expected to benefit from its technology acquisition, but Pactel Spectrum was not a success. Analysts pegged losses at $250 million, an estimate knocked by a Pactel Spectrum spokeswoman as "rather high." However, she admitted, the venture was not profitable.

"What we found was that many customers prefer to buy a full range of network management services [from one provider], and we only offered a niche product, or one element," the spokeswoman said, citing regulatory restrictions that Pactel claims kept it from offering certain services.

Group pitches speedy filer protocol

BY ELISABETH HORWITT
CW STAFF

Convinced that popular networking protocols such as TCP/IP and OSI are too inefficient to take advantage of the upcoming generation of high-speed fiber-optic networks, a consortium of computer vendors is working toward a new networking standard designed to support data rates of up to 1G bit/sec.

Express Transfer Protocol (XTP) was originally developed by Gregory Chesson, chief scientist at Mountain View, Calif., workstation vendor Silicon Graphics, Inc.

The protocol addresses the needs of users "who want to do real-time networking between DEC, Sun, HP, IBM and Silicon Graphics computers" but have found existing standards to be too slow and proprietary solutions too expensive, Chesson said.

XTP goes public

Silicon Graphics put the protocol into the public domain and commissioned a recently formed company, Protocol Engines, Inc., to license it and generate industry support for the protocol as a networking standard.

XTP will perform the same functions as transport-layer protocols such as the ISO's Open Systems Interconnect (OSI) standard and the Transmission Control Protocol/Internet Protocol (TCP/IP), which were "designed to run on slower systems," Chesson said. "TCP/IP was developed for [Department of Defense network] Arpanet, which runs at 56K bit/sec. Even with [10M bit/sec. Ethernet], it adds a lot of processing overhead to execute commands."

In contrast, XTP is designed to take advantage of the 100M bit/sec. bandwidth of the Fiber Distributed Data Interface (FDDI) networking standard and can support even faster rates of up to 1G bit/sec., Chesson said.

The protocol is said to streamline communications in a variety of ways; for example, by using network flow control to avoid potential traffic jams and eliminating handshaking for certain types of transmission. In addition, XTP is designed to be "cast directly into silicon," providing a cost-effective way for vendors to incorporate the protocol into their workstations without adding significant overhead to the main processor, Chesson said.

The protocol could prove useful to "some of our clients who have told me that OSI chews up all of a computer's CPU cycles on an FDDI network, making it very hard to take advantage of that bandwidth," said David Passmore, a principal at Fairfax, Va., consulting firm Network Strategies, Inc.

Martin Marietta plans to evaluate XTP for possible inclusion in Safenet, a growing collection of networking protocols that the U.S. Navy, and possibly other U.S. military organizations, will adopt as a networking standard. XTP "looks very promising [as] the first transport-layer protocol that will be put" on a chip, said Richard Steinberger, a manager of digital design at Martin Marietta.

The Baltimore systems integrator is particularly interested in XTP's support of FDDI, which has already been incorporated into Safenet, according to Steinberger.

While the majority of naval computer operations do not currently need the bandwidth XTP and FDDI provide, the organization needs to implement networking products that will fill its needs for the next 20 years, Steinberger said. "The Navy is slow to make technological changes, because it means you have to take the ship apart," he explained. "If the bandwidth isn't used now, it will be soon," especially since the Navy is in the process of going from centralized to distributed computing.

Alternatives available

Potential alternatives to XTP do exist. One is a streamlined version of TCP/IP, still in the development stages, which reportedly runs five times faster than the current version. Another is Minimap, a "bare-bones version of the Manufacturing Automation Protocol" that was developed for processor controller networks, Passmore said. Minimap is based on Layers 7 and 2 of the MAP protocol, excluding Layers 3 through 5. This eliminates certain functions, such as internetworking, "but boy, does it run fast," Passmore said.

Unlike these protocols, however, XTP does not sacrifice functionality for speed, according to Chesson. The protocol "has everything TCP/IP has," including routing and network management capabilities and a flexible addressing scheme for internetworking, he said.

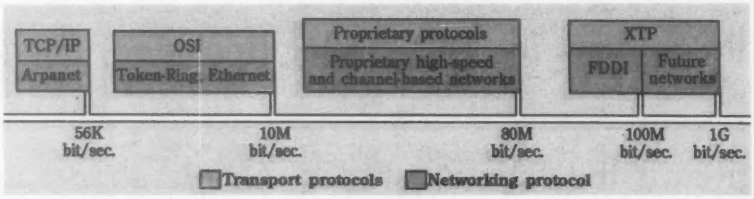
One of XTP's unique features is a method by which lost or faulty packets can be identified and retransmitted during a multicast transmission — one workstation simultaneously sending the same data to several other computers. This feature is a prerequisite for ensuring consistency among distributed data bases, Chesson said.

A group of 60 to 70 interested companies met in January to discuss future directions for XTP. Current board members are Silicon Graphics, Unisys Corp., Apollo Computer, Inc., Interphase Corp., Artel Communications Corp. and systems integrator Martin Marietta Aero and Naval Systems. The organization will also be working toward proposing XTP to the American National Standards Institute as a future standard.

The consortium aims to have a stable protocol by June. Apollo, Unisys and Martin Marietta plan to be the first companies to develop board-level implementations of XTP for testing on their own systems, with the ultimate goal of "getting it down to a couple of intelligent chips," Chesson commented.

Transmission factors

XTP was designed to overcome limitations of earlier protocols that were initially intended for network technologies much slower than the 100M bit/sec. bandwidth of FDDI



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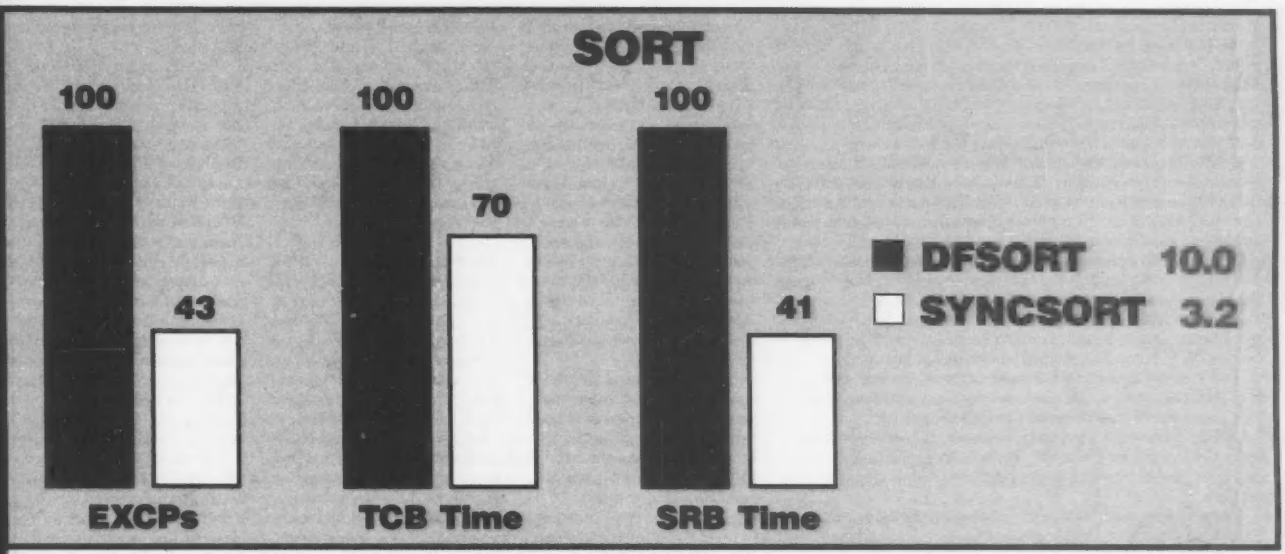

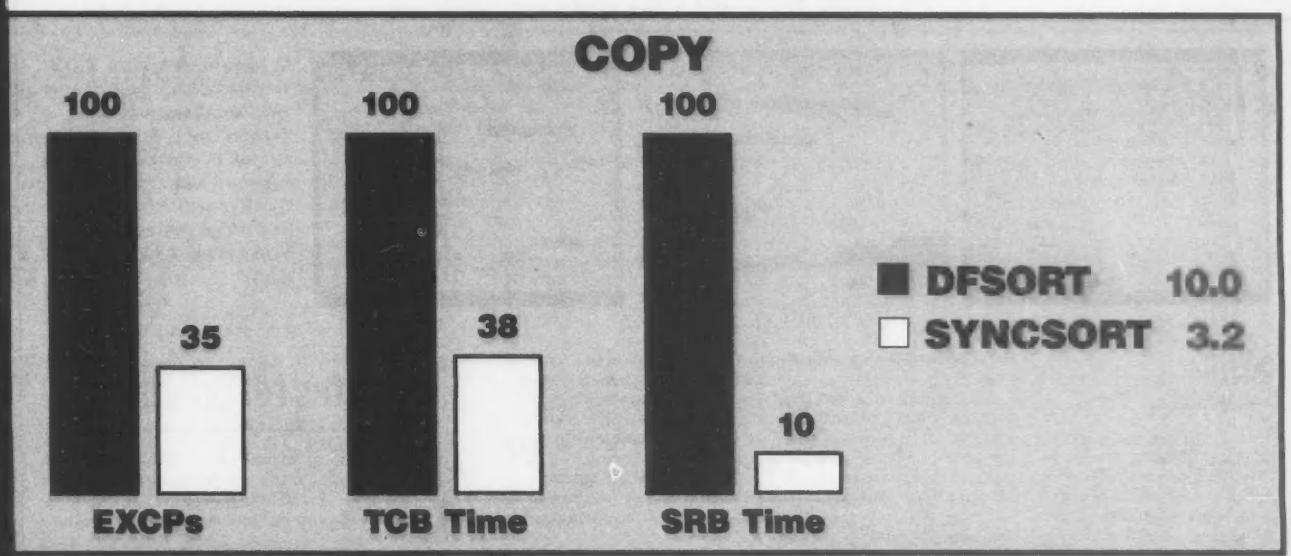

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Bits, icons and windows: An interface time line

Following is a brief history of the graphical user interface and the Macintosh:

1965: A professor at Stanford University, credited with devising the first mouse-like device, experiments with textual representation through a graphics interface.

Mid- to late 1970s: Engineers at Xerox Corp.'s Palo Alto Research Center (PARC) pick up on the graphics approach and develop what eventually becomes the Star computer and its Smalltalk system. Apple Computer, Inc. later uses the Star interface as a model for the windows and icons look of its Lisa and Macintosh. But priced at nearly $20,000, the Star is too expensive for its own good.

1979: Apple co-founder Steve Jobs attends a software developers conference sponsored by Xerox to spark interest in its Star machine. Jobs follows up with a visit to PARC and walks away convinced that the graphical, intuitive interface spawned at the center is the key to the computer of tomorrow.

1983: Apple's Lisa personal computer is introduced and almost immediately flops, too slow and expensive to carry out Jobs' vision of commercial success.

1984: Apple's first Macintosh rolls out and touches off a new software market, to be called desktop publishing, with its graphical user interface. A cadre of loyal followers begins to line up.

1985: Apple formally licenses use of the Mac's look and feel to Microsoft Corp. for current and future Macintosh versions of Multiplan, Chart, File, Excel, Word and Windows Version 1.0.

1986: Apple threatens Digital Research, Inc. with a lawsuit for using certain graphical features in its Gem applications program manager. Digital Research backs down and makes changes in the program.

1988: Apple sues Microsoft and Hewlett-Packard Co. for infringing on copyrights that Apple says protect the audiovisual look and feel of the Macintosh.

STEPHEN JONES

Apple decides enough is enough

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc.'s decision to file suit against Microsoft Corp. and Hewlett-Packard Co. appears to be a recognition that the competition is gaining on its user-friendly technology, according to industry watchers.

Those close to the company caution that Apple does not enter into litigation lightly and expects to win. "It took [Apple Chairman and Chief Executive Officer] John Sculley a year to decide to do this," one source said. Added another, "It became sort of a give 'em an inch, take a mile sort of thing. At some point, Apple decided, 'Too much is too much. This is becoming dangerous.' "

Apple's graphical user interface has been the most important part of its appeal and has differentiated the Macintosh from other personal computers. Unlike IBM, Apple had managed to maintain its uniqueness. The lawsuit may be Apple's attempt to protect its user-friendly interface, with heavyweights like HP and IBM closing in with the help of Microsoft.

What Apple would consider to be a victory remains cloudy. Despite its action, it is not likely that Apple expects to eliminate window-type environments for PCs other than the Mac.

"Even if Apple wins, I don't think you can say that there won't be any graphically oriented interfaces in the PC market," said Rich Edwards, industry analyst for Robertson, Colman & Stephens. Apple "seems to be telling the industry how close you can get to the Mac before it will take action."

Roadblock

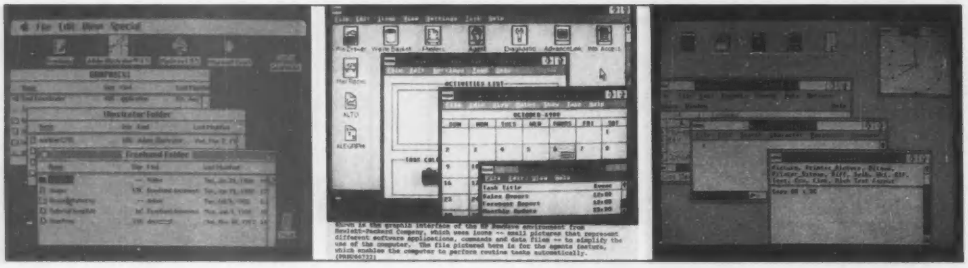
Apple may consider its efforts a success if it impedes the progress of Microsoft's Windows 2.03 and, in turn, IBM's Personal System/2 line, which will use that technology in its Presentation Manager component of OS/2. If the future of Windows 2.03 appears uncertain, third-party software houses may stop developing for the Windows environment. Last week, Borland International said it will cease development of a Windows version of its popular data base package Paradox.

"The victory will be in bringing fear, uncertainty and doubt in the minds of Windows developers," said a source close to the company who requested anonymity. "The victory will be in making developers move to the Macintosh."

For its part, Apple said it wishes to defend its "intellectual property," despite the fact that the company "borrowed" the technology from Xerox Corp.'s Palo Alto Research Center. In the suit, Apple asks that Microsoft's Windows Version 2.03 and HP's New Wave operating environments be removed from the market.

"Copyrights cover the expression of ideas that also cover computer software," said an Apple spokeswoman. "It's that unique expression of ideas that differentiates the Mac, particularly the screen display."

Although Microsoft Chairman William Gates is irate over the suit, it is unlikely that Microsoft will abandon the Macintosh as a platform for its applications. However, the suit sends a clear message that Apple thinks it is no longer solely dependent on Microsoft for its success.



Windows Version 2.03 *(right) features overlapping or tiled windows, something present in Apple's scheme (left), but not in earlier Windows versions, while HP's New Wave (center) utilizes that feature and an increased use of the icon approach favored by Apple*

Suit

FROM PAGE 1

because of the allegations made by Apple. The company has decided to stop all development on a Windows version of its Paradox data base management system. Although about 80% of the project is completed, Borland President Philippe Kahn said the lawsuit poses too many potential problems.

"At this point, we need to develop for environments that are going to be commercial successes, and this lawsuit casts too much doubt on the future of Windows," Kahn said, adding that Borland will continue to work on its version of Paradox for the Presentation Manager.

One other hesitant developer was Heidi Roizen, president of T-Maker Co. in Mountain View, Calif. T-Maker will continue work on its Windows-compatible application, but Roizen questioned whether IBM and Microsoft will emerge from the suit unscathed.

"We're going to ignore the angry gods for a while and keep our noses to the grindstone. But you have to wonder how you could sell applications if no environment exists," she said.

Lightweight suit?

Developers said the suit has little merit and added that they do not clearly understand the technical grounds on which Apple bases the litigation.

One pointed out that Microsoft changed its applications icons from Windows Version 1.04 to 2.03. In Version 1.04, the applications icons were located at the bottom of the screen and could not be moved. In Version 2.03, the applications icons could be moved around the screen, giving the interface a look that is more like that of Apple's Macintosh.

HP's New Wave operating environment, which was also cited in the Apple suit, uses movable applications icons even more extensively, making it look even more like the Mac interface (see story page 35). HP is credited with contributing underlying code to Windows Version 2.03.

"In effect, HP got Microsoft involved in this suit by extending Windows 2.03," one developer said.

Another developer thought the suit could backfire on Apple by stimulating interest in Windows. Paul Grayson, chairman of Micrografx, Inc. in Richardson, Texas, compared the action to the 1984 poisonings that rocked Johnson & Johnson's Tylenol.

"While it hurt Tylenol sales for a while, that made the product a household name," Grayson said. Through the suit, "Apple could end up only educating people about how similar Windows and the Mac are, which could increase Windows' sales."

Washington correspondent Mitch Betts and West Coast correspondent Stephen Jones contributed to this report.

Gates responds

A visibly irritated William Gates, chairman of Microsoft Corp., responded to Apple Computer, Inc.'s lawsuit against his company last week, saying the Apple Macintosh's interface techniques could not be copyrighted and asserting that a 1985 license agreement between the two companies invalidated Apple's claims.

Speaking at a press conference in Alexandria, Va., Gates said Microsoft has made no modifications to its Windows interface that violate the terms of the agreement. The accord gave Microsoft access to the Macintosh's "visual display" for current and upgraded versions of Windows Version 1.0.

"There's nothing that's happened in Windows to move it closer to the Mac," Gates said. "The suit will just be there for years." He said the major changes from Version 1.0 to Version 2.03 of Windows were the addition of windows-based multitasking and a change to the interface that allows windows to overlap each other. Apple's multitasking software, called Multifinder, "doesn't do the windows in the same way at all," Gates said.

Gates said the Apple suit took Microsoft by surprise. "I talked to [Apple Chairman] John Sculley [the day before the suit was filed] about other issues, and he didn't mention anything of the kind," he said.

Feud shrouded in ambiguity

BY STEPHEN JONES
CW STAFF

Nestled in the heart of the raging controversy between Apple Computer, Inc. and Microsoft Corp. is an ambiguous 1985 license agreement bearing the signatures of William Gates and John Sculley.

Microsoft believes the pact gives it open-ended access to Macintosh's visual display for current and upgraded versions of a number of applications and the Windows 1.0 operating environment. Apple, on the other hand, contends the agreement does not cover some Windows 2.03 screen displays that it claims illegally copy the windows and icons of the Macintosh interface.

Confusing? Throw in some controversial "look-and-feel" legal precedents, an ongoing debate on the difference between inventors and copycats and questions over the actual origin of the Macintosh interface, and you have the makings of a monumental computer industry debacle.

Reading the fine print

Legal experts said the crux of this legal entanglement can be found in the paragraph of the two-page agreement that grants Microsoft "worldwide, royalty-free and perpetual" use of the Macintosh look-and-feel in certain Microsoft applications and the Windows environment in "present and future" versions of those programs. The simplicity of that description, attorneys said, apparently gives Microsoft an edge before the courtroom doors are even opened.

"The implication is that Microsoft has been granted general rights with specific limitations, and it looks like they haven't gone past those limits," said G. Gervaise Davis III, a veteran of software copyright protection law with Schroeder, Davis and Orliss in Monterey, Calif.

Davis said the document was drawn up in a way that actually benefits Microsoft more than Apple. While Apple gave up perpetual rights to the Macintosh interface for future versions of such applications as Word and Excel, Microsoft only granted Apple access to the new screen displays that it will develop for up to five years after the Nov. 22, 1985 contract.

Observers also questioned whether Apple believes it can use the loosely defined agreement to cripple the adoption of Microsoft's Windows and eventually OS/2 Standard Edition 1.1 with the Presentation Manager.

The fact that Apple had not filed a request for a temporary restraining order and subsequent injunction blocking the continued sale of Windows led some to believe that Apple was after something other than a landmark court decision. To receive an injunction, a substantial likelihood of success in the lawsuit must be proved by the plaintiff.

"In this situation, a company would typically file for an injunction; it suggests that the publicity of the suit was probably a large motivating factor for Apple," said Donna Sherry, an expert on high-tech legal issues and a partner with Gaston & Snow in Boston. "Maybe they decided they wouldn't have a high percentage of success if they filed for an injunction."

Users: Apple suit rotten

Apple Computer, Inc.'s lawsuit against Microsoft Corp. and Hewlett-Packard Co. seems to be about as popular with users as a system crash.

"It is stupid and disruptive," fumed a software developer at a Big Eight accounting firm.

While most users said the suit will not affect their plans to move to Microsoft Windows or the OS/2 Presentation Manager, some are not so sure.

"It puts the industry in a quandary on connectivity, support, open-ended architecture, etc.," said Ronald Blystone, director of MIS at Harsco Corp. in Camp Hill, Pa. "All of a sudden, there's this smell of something corrupt — a rat in the woodpile."

"The uncertainty slows down some development. It puts you in a wait-and-see mode," said a manager at a large Midwestern firm in charge of more than 50,000 microcomputers.

Another suit possible?

Liam Egan, director of end-user computing for Dean Witter Reynolds, Inc.'s financial services group, said he is most concerned about whether Apple will file a similar suit over the OS/2 Presentation Manager, which is being jointly developed by Microsoft and IBM.

Egan's group has committed to OS/2 Presentation Manager as its future operating system. But with 150 copies of Windows Version 2.03 installed, he cannot help but worry about the pending lawsuit.

"It's definitely a concern that we have a product that we might not be able to use in the long-term," Egan said.

Recall not a concern

One thing users are not worried about is a product recall.

"There has never been a precendent where someone forced a recall," the Big Eight developer said.

"They can fight it out. Meanwhile, I have the software," he added.

Tsotomu Ishii, of Tokyo, wrote the names of 44 countries on a single grain of rice.*

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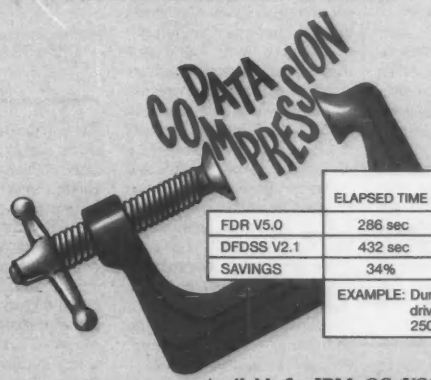

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Ideal joins DB2 world

BY CHARLES BABCOCK
CW STAFF

PRINCETON, N.J. — Applied Data Research, Inc. (ADR), the supplier of a bitter competitor to IBM's DB2, has modified its fourth-generation language, Ideal, to allow it to generate DB2 applications.

With last week's announcement, ADR followed on the heels of Software AG, which last year modified its Natural fourth-generation language to work with DB2. Both ADR and Software AG offer their own mainframe data base management systems.

"In order to compete with DB2, they have to become compatible with DB2," added George Schussel, president of Digital Consulting, Inc. in Andover, Mass.

More IBM than IBM

ADR's Release 2.0 of Ideal, a $175,000 product, is now more compatible with DB2 than IBM's own fourth-generation language, Cross System Product (CSP).

Release 2.0 of Ideal, available immediately, will include an application dictionary that can store definitions in DB2 tables. CSP definitions have to be stored in the CSP dictionary. Sources familiar with both products said the CSP naming convention is limited to eight characters, while names of up to 18 characters are recognized by the DB2 catalog.

Versions of programs and audit trails of who worked on which program are tracked and created by the change control facility in Ideal, noted Philip J. Gray, manager of systems services at Datasolve, a beta-test user of Release 2.0 in Sunbury, England.

Like CSP, Ideal supports either static or dynamic SQL. The latter speeds application development, and the former enables the same program to run in batch mode, Gray said.

Changing from dynamic to static SQL requires the change of one parameter on an Ideal screen, he said.

Software AG's Natural will add static SQL this fall.

Many DB2 users running batch applications under IBM's TSO teleprocessing monitor used the Attach TSO facility. ADR chose to use the Call Attach facility, which avoids the overhead of TSO, in running a batch application, ADR's Mary Anne Borge said.

These DB2 features have been added to a language that is recognized for offering "a very nice, structured environment" and "highly readable, English-like syntax," Digital Consulting's Schussel said.

ADR officials said Ideal can also pass to DB2 all the information needed to generate an application plan, a precompile process that determines what resources the program will need.

Gray said Datasolve, a subsidiary of Thorn EMI, has more than 1,000 programs written in Ideal and yields a 7-to-1 gain in speed of coding over Cobol.

Study: RISC isn't for business

BY STANLEY GIBSON
and JULIE PITTA
CW STAFF

Most businesses seek to avoid risk. If the results of a recent study are widely followed, they may want to avoid RISC, too.

Neal Nelson & Associates recently made public the results of tests performed on Sun Microsystems, Inc.'s Sun-3 and Sun-4 workstations, in which the reduced instruction set computing (RISC) processor-equipped Sun-4 sometimes lagged behind its Sun-3 predecessor.

According to Sun, the Sun-4, which contains the company's Scalable Processor Architecture (Sparc) microprocessor, offers more than 10 million instructions per second (MIPS), and the Sun-3 is capable of 4 MIPS.

Back to business

Neal Nelson, president of the research firm, said Sun's claim of 10 MIPS is based on results obtained from running the Dhrystone benchmark, a technical computing measurement. However, Nelson applied his firm's Business Benchmark to test the general-market usefulness of the Sparc processor and of RISC machines in general.

Nelson said Business Benchmark, a multitasking benchmark written in C, measures a computer's performance in computation- and disk-intensive tasks. The test showed that in eight of the 18 tests that make up the suite, the Sun-3 ran up to 50% faster than the Sun-4.

A Sun spokesman said the company does not disagree with the results of Nelson's tests. "What they've done is a benchmark of business applications. It focuses on I/O performance, not CPU performance. Business applications aren't the markets we've targeted," he said.

Nonetheless, Sun has been licensing its Sparc chip for use by a wide variety of computer vendors, some of which specialize in commercial applications.

AT&T, the first major Sparc licensee, has said it plans to migrate its general-purpose computers to the Sparc design. However, an AT&T spokesman declined to comment on the test.

No party for PS/2

At age 1, uncertainty, high price hurt popularity

BY ALAN J. RYAN
CW STAFF

IBM's Personal System/2 celebrates its first birthday this week. But while users said the line is maturing, that still doesn't mean the new bus architecture on some models and the endorsement of television's *M*A*S*H* cast add up to widespread corporate acceptance.

Although some hardware enhancements are finally in place, users indicated that the systems themselves are still pricey and, some said, overrated.

Some users claimed the Micro Channel architecture, touted in some PS/2 models, is the drawing card, but others remain uncertain about specific benefits of the new bus.

"To me, the Micro Channel architecture is fine, but there is nothing magical about it," said Jeff Ehrlich, manager of product technology for General Electric Co.'s product technology group.

Ehrlich termed the IBM bus's purported ability to accommodate multiple master processors as "no big deal. You can buy an Irma card [from Digital Communications Associates, Inc.] with a processor on it; you don't need the Micro Channel to put microprocessors on expansion cards," he said.

One user said the new bus was just another way for IBM to plant itself even deeper into the personal computer marketplace.

"I see it as IBM's consolation — without increased capability — to the higher end customers, those who will buy only IBM," said Stuart Denrich, vice-president of data processing at Valu Food, Inc. in Baltimore.

It's in the numbers

According to Dataquest, Inc., a San Jose, Calif.-based research firm, IBM shipped approximately 700,000 PS/2s in 1987, and that number is expected to grow to 1.7 million this year. By 1990, when software applications for OS/2 should be abundant, shipments could climb to six million, Dataquest predicts.

Most users contacted by *Computerworld* last week said they would purchase PS/2s specifically to run OS/2, the operating system IBM developed with Microsoft Corp. They also said they are awaiting applications written for OS/2.

"The only reason I would buy the PS/2 would be to position myself to utilize the software," said Joseph Chester, manager of MIS at American Tape Co. in Marysville, Mich. "Other than that, there is not a lot of benefit to the PS/2."

"The PS/2 will hit its stride when the Micro Channel architecture and OS/2 begin to blossom a bit," said Joseph Vincent, director of technology planning at Humana, Inc. in Louisville, Ky.

Also holding some users back is the fact that IBM has already announced plans to upgrade the line with better price/performance.

Those contacted last week said the PS/2 Models 50, 60 and 80 were becoming increasingly popular. Camp Hill, Pa.-based Harsco Corp. expects to purchase several Model 80s later this year to act as file servers, according to the firm's MIS director, Ronald Blystone.

Allison Eisenberg, systems manager of microcomputers at Liz Claiborne, Inc. in Secaucus, N.J., said her company has standardized on the PS/2 line.

"We started buying them when they came out, and that's all we use. They're fine," she said. "But if I could buy a different machine, I might."

At first, Eisenberg said, the scarcity of emulation boards for the computers created problems, but those have since been eliminated.

Floating Point minisupers for high end

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — Floating Point Systems, Inc. targeted two of its rivals last week by unveiling five minisupercomputers it claimed are up to 70% faster than its competitors' fastest machines at a 27% price premium.

Weakened and unstable from its $29.2 million loss in 1987, this year's first-quarter loss of $5.7 million, a management shake-up and the layoff of one-fourth of its work force, Floating Point is concentrating mainly on its scientific market.

Two weeks ago, the company said it would discontinue its T series parallel supercomputer if a development partner could not be found. No T series machines were sold in the past quarter.

Beyond belief?

"Floating Point has a credibility problem," said Sanjiv Hingorani, an analyst at Salomon Brothers, Inc. in New York. "It's going to take more than a single product to make them viable."

However, if the high end of the line can perform as claimed, other analysts said, at least the one product could be a hit, although few see the market growing until late this year.

"There is an insatiable need for power in the scientific/engineering community," said John Logan, an analyst with Boston-based The Yankee Group. The top of the M64 line is the 145 Model G with 31 processors, which the firm says can deliver 341 peak million floating-point operations per second (MFLOPS) at $1.75 million. Floating Point compared that model to Convex Computer Corp.'s fastest system, the C240, which Convex says runs at 200 MFLOPS at $1.35 million.

Floating Point's closest competitors, Convex and Alliant Computer Systems Corp., have announced machines in the last two months. Convex said its fastest one will be available in the fourth quarter. Three machines in the series are available now.

Alliant's FX/80 is its fastest machine; it has eight processors and is claimed to run at 158.8 MFLOPS at a cost of $653,000. All are currently available.

In addition to Floating Point's 31-processor machine, there are four lower end M64/145 models, the C, D, E and F, which reportedly range from three to 17 processors and 33 to 187 peak MFLOPS, according to Floating Point. Prices are guaranteed for the first three months, beginning at $395,000.

Parallel feats

Floating Point adds five models to its M64/145 line of minisupers, using up to 31 processors to achieve 341 MFLOPS[1]

	Peak performance (in MFLOPS)	Number of processors	Linpack benchmark[2] (in MFLOPS)	Base price[3]
Model G	341	31	101	$1.75M
Model F	187	17	79	$986,000
Model E	99	9	55	$637,000
Model D	55	5	36	$463,000
Model C	33	3	24	$395,000

[1] Millions of floating-point operations per second
[2] 1,000 by 1,000
[3] Until June 15

INFORMATION PROVIDED BY FLOATING POINT SYSTEMS, INC.
CW CHART

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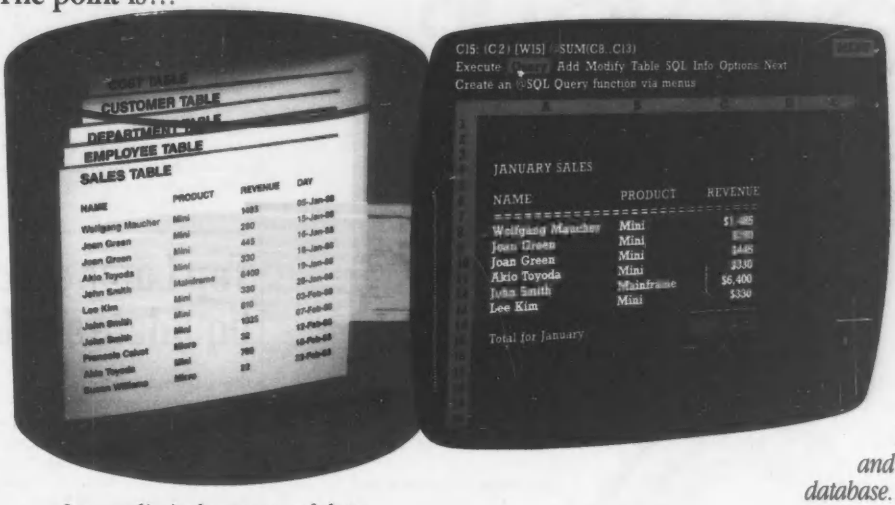

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TRBA

Lotus fumbles

CONTINUED FROM PAGE 1

er, Inc.'s Macintosh and 1-2-3/G for the OS/2 Presentation Manager, observers speculated. Although Lotus declined to provide delivery dates, observers said the products will not ship until the tail end of this year or perhaps 1989.

Lotus's 1-2-3 Release 3 was originally scheduled to ship early this year and had already been pushed back to late in the second quarter before the firm announced the most recent delay last week. Lotus said it needed the additional time to fit the product into the memory space of Microsoft Corp.'s MS-DOS.

Lotus 1-2-3/M, a critical mainframe application for both Lotus and co-marketer IBM, will not be delayed, Lotus said. Lotus 1-2-3/M, originally set to ship shortly after Release 3, is now expected to ship before the new PC spreadsheet.

"You don't have similar memory constraints on the mainframe as you have for DOS," said Iran Salim, Lotus vice-president and general manager of the firm's PC Spreadsheet Division.

Although disturbed by the delay, Lotus users contacted last week appeared unwilling to switch wholesale to another spreadsheet.

"Lotus enjoys a very entrenched installed base. There is a major commitment to training and the development of models and templates. Changing a release date won't change all those factors," said a manager in charge of more than 50,000 micros at a large Midwestern firm.

"We are disappointed," said Jon Seebach, director of microcomputer resources for McGladrey Hendrickson & Pullen, the 12th largest accounting firm in the U.S. Although disappointed, Seebach said he is not ready to switch plans. "We might have a few users move to Quattro, but we are not just going to throw 1-2-3 Release 2.01 away."

One user saw Lotus as vulnerable. "Lotus runs the risk of seeing their market erode, but it will be gradual," said Frank Diasparra, vice-president of the advanced technology group of Fidelity Investments in Boston.

As a result of the Release 3 delay, Lotus's ambitious communications strategy will also not get off the ground anytime soon. The scheme, called Blueprint, consists of a common data interface that will debut with Release 3 and will be extended to the rest of the Lotus product line. The interface allows Lotus applications to communicate with each other and with applications from vendors who support the Lotus data interface.

Party time

Last week was Mardi Gras for Lotus's competitors. "We are already all drunk, we spent the night partying," joked Philippe Kahn, president of Borland International, which has made a low-end run at 1-2-3 with its popular Quattro integrated spreadsheet. Borland has shipped 125,000 copies of Quattro since last December, Kahn said.

Although sober, Microsoft Chairman Bill Gates also celebrated the Lotus delay. "There were certainly a lot of excited people back in Redmond," he said.

Tensions and personality conflicts between Microsoft and Lotus employees have escalated recently with Microsoft's aggressive pitching of its Excel spreadsheet against 1-2-3. "People will look even harder at Excel and not have this new version [of 1-2-3] looming over them," Gates argued.

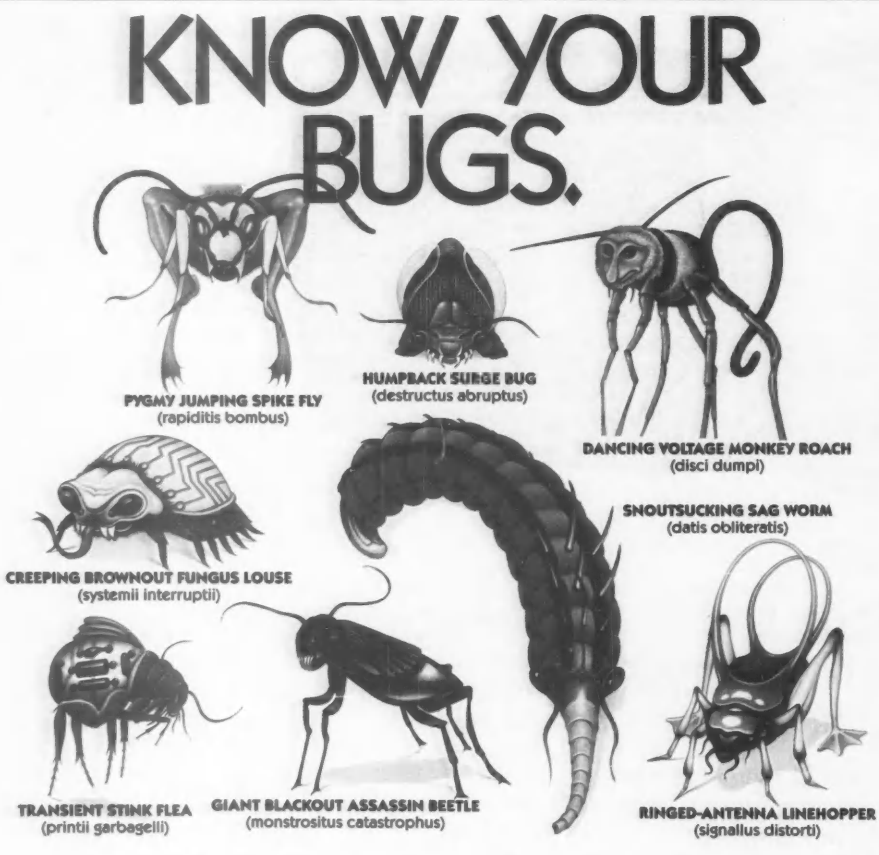
Top Lotus execs liquidate stock

Lotus Development Corp. took some additional heat last week with the news that several of its key executives, including Chairman Jim P. Manzi, sold off large blocks of stock in February, just one month before the firm announced the delay of its revamped 1-2-3.

Lotus has acknowledged that the Securities and Exchange Commission has started an informal investigation into insider trading, but it downplayed threats of a class action lawsuit by shareholders.

The sales, including a 250,000-share transaction by Manzi, "were timed with the exercise of stock options, along with some personal obligations," said Tom Lemberg, Lotus's vice-president and general counsel. "Nobody had any knowledge that the announcement [of the delay] would be made."

Lotus did keep one card up its sleeve to play amid last week's bad news: It named Frank King, former vice-president of development at IBM's Entry Systems Division, senior vice-president of its Software Products Group. King replaces Charles J. Digate, who recently resigned. King was not available for comment.



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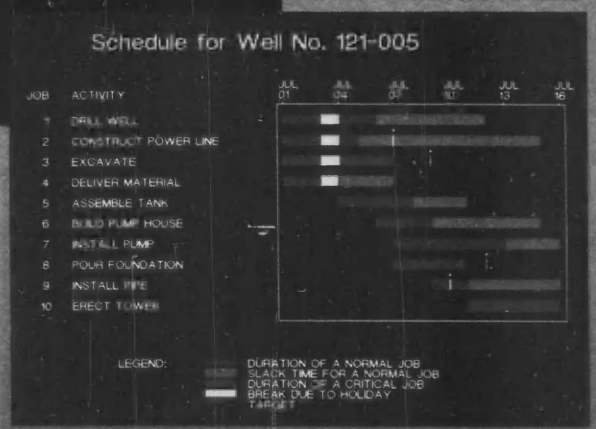

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Flurry of products to debut at Interface '88

BY PATRICIA KEEFE
CW STAFF

CHICAGO — Interface '88 kicks off here today with a dual focus on network integration and distribution issues.

The show is expected to attract 15,000 attendees, 2,000 more than last year, while the newly launched World Computing Conference is expected to draw another 5,000.

Few major product announcements are expected at what is shaping up to be a quiet connectivity exposition. However, a robust schedule of product announcements features a number of introductions in some hot topic areas:

IBM's LU6.2.

• Eicon Technology Corp. in Montreal will detail plans to support LU6.2 and CCITT X.25 on IBM's Micro Channel architecture under OS/2. Eicon is also scheduled to announce three additions to its line of IBM Advanced Program-to-Program Communications/LU6.2 products, including support for IBM's Synchronous Data Link Control, X.25 and third-party emulation and enhancements to its IBM 3270 and 5250 gateways.

Network management.

▪ Connect Computer Co. is set to unveil an interface to IBM's Netview for its Lanscope network management system.

• Tellabs, Inc. is set to introduce Telemark, a comprehensive network management and control system designed to provide single-point control and maintenance of voice and data networks.

• Retix is slated to announce the Retix Network Manager, integrated network management for its Retixgate series of Ethernet bridges. It features software that resides in bridges, gathering statistics and responding to control messages, and a personal computer-based software module that acts as the central control for the network.

Fiber optics.

• Fibercom, Inc. is set to introduce Whisperlan/TP, said to be the first twisted-pair Ethernet configured with a fiber-optic ring backbone.

Open Systems Interconnect (OSI).

• Philips Information Systems, Inc. in Mountain View, Calif., will unveil the OSI-PC board, said to enable developers to implement OSI applications protocols. A communications processor with a large memory manages the seven layers of OSI, freeing the CPU to perform typical PC functions. The card also functions as a local-area network and X.25 gateway.

• San Fransisco-based Cisco Systems, Inc. is set to introduce the International Standards Organization (ISO) Gateway, said to implement ISO network layer, or Level 3, support. Priced at more than $1,000, it is set to ship in June. Also set to debut is a Hybridge network card that works as both a bridge and router. The $6,200 board, which links Ethernet networks, also allows users to tie into Digital Equipment Corp.'s Decnet terminal server network.

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DSC's third-generation LAN competes with Novell, 3Com

BY KATHY CHIN LEONG
CW STAFF

SANTA CLARA, Calif. — Filling the gap for increased file server storage and instantaneous network backup, DSC Communications Corp. has unveiled what it calls a third-generation local-area network designed to rival IBM, 3Com Corp. and Novell, Inc. products.

Announced by the DSC Business Network Systems Group, which includes the former Nestar Systems, Inc., the Nexos LAN family is considered a third-generation network when compared with the initial LANs that served as printer-sharing devices and second-generation LANs that linked local devices without providing connections outside the network.

The Nexos LAN features its own network operating system; network interface cards that support token-ring, Ethernet and Arcnet; 1.3G-byte file servers; and communications gateways into the CCITT X.25 and IBM Systems Network Architecture worlds. The firm will need plenty of marketing muscle to go up against the mainstream networking giants, but DSC's products appear to provide some benefits not readily available. "DSC is going after the power user," said Gary Kwok, director of marketing at the Lanquest Group. "These products are designed to attract MIS directors with network sites in multiple locations."

According to DSC officials, the Nex/OS operating system offers data base engine support and support for multiple servers through a multiplexing driver. Eric Siegal, DSC's director of marketing programs, said 3Com, Novell and IBM do not currently offer these features.

As a result of a joint agreement with Wordtech Systems, Inc. and Data Access Corp., customized data base versions have been developed for Nex/OS. In-house tests revealed that Nex/OS can process versions of Wordtech DBXL Database Manager and Data Access Dataflex Database Manager up to 600% faster than original off-the-shelf versions when users process index records at the file server, not the workstation.

The operating system, priced between $1,195 and $3,995, will support applications written for the Novell Netware environment — a feature that has set 3Com back from sales, said Tom White, president of Infonetics, Inc. He stressed that DSC will have a tough road to hoe. "These features are here now, but how long will it take for others to catch up?"

Illinois Bell ready with first ISDN FCC rate petition

BY ELISABETH HORWITT
CW STAFF

CHICAGO — Illinois Bell is expected this week to be the first U.S. carrier to file a regular Integrated Services Digital Network (ISDN) tariff with the Federal Communications Commission.

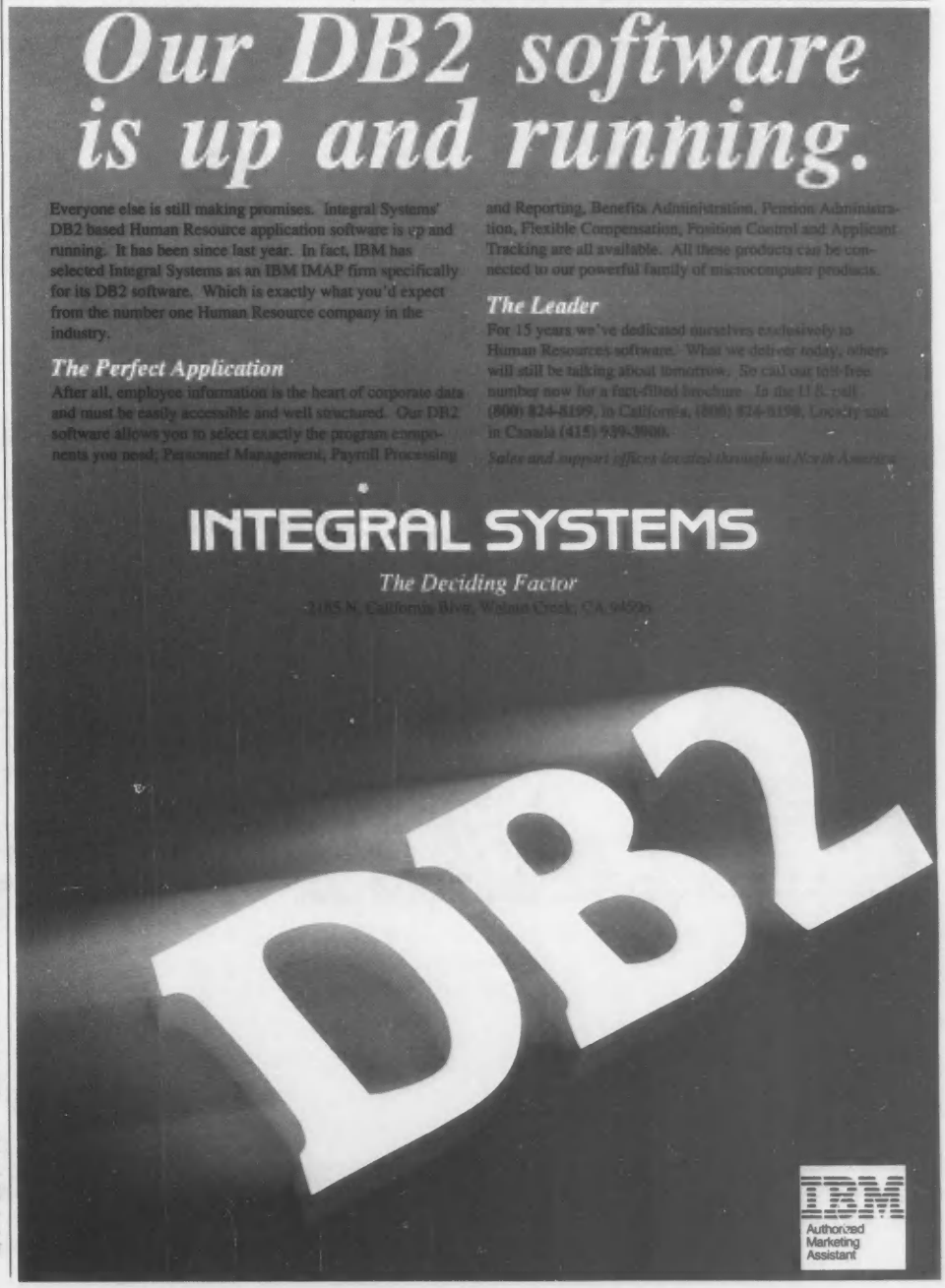
The Ameritech-owned divested Bell operating company confirmed that it will announce a Basic Rate Interface ISDN tariff at the Interface '88 conference to be held here this week. While Illinois Bell would not give details on the rates it will request in the tariff, several industry sources agreed that the cost of one Basic Rate line, which defines two 64K bit/sec. digital transmission channels, will be between 1½ and two times the cost of regular digital Centrex lines. This would put the service's price at between $20 and $30 per month per line, according to Joaquin Gonzalez, a vice-president at Stamford, Conn., consulting firm the Gartner Group, Inc.

The initial attractiveness of the ISDN service to customers will depend on whether Illinois Bell, and eventually other Bell operating companies, charge only a set monthly per-line rate for Centrex-like ISDN services that are provided by one central office switch, Gonzalez said. "If the Bell operating companies decide to charge for usage, consider ISDN dead; if they don't, tell me more," he said.

A flat $40 monthly rate for a point-to-point connection would make ISDN an inexpensive alternative to point-to-point 56K bit/sec. Digital Dataphone Service connections, which can cost between $200 and $300 per month per line, Gonzalez said.

Tenneco, Inc. made sure it would get a flat monthly rate and no usage-sensitive charges when it worked out its ISDN contract with Southwestern Bell, said John Saccente, the holding company's director of telecommunications.

Tenneco's ISDN service, which is scheduled to go on-line in mid-May, is not a regular tariff, but rather a Customer-Specific Proposal that Southwestern Bell Corp. filed as a special tariff. A Southwestern Bell spokesman said the company plans to file a non-usage-sensitive tariff in early 1989.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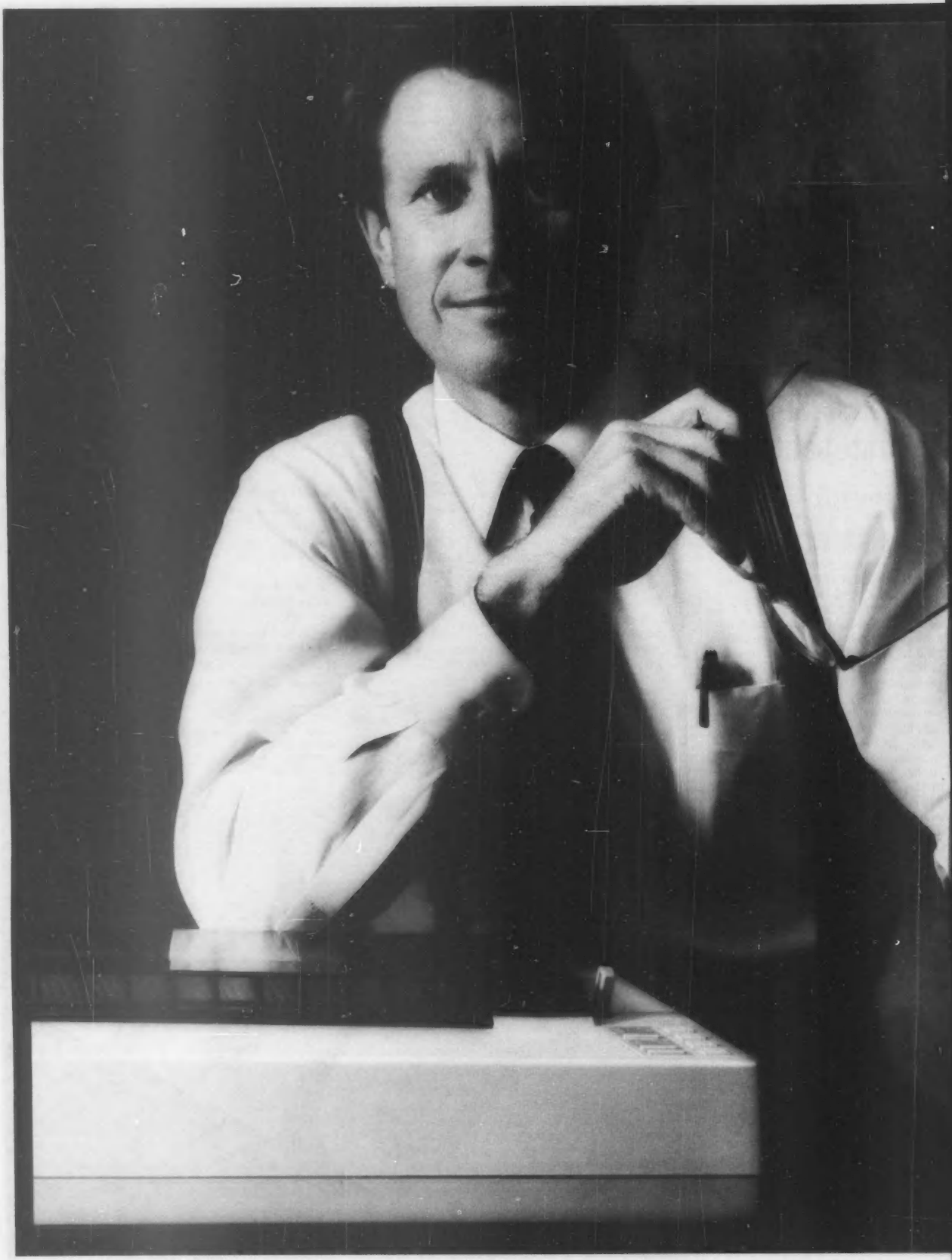

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EDITORIAL

Facing the music

IN THE MOVIE *Bad Day at Black Rock,* Spencer Tracy played a crippled war veteran who descends on a small town in search of links to his past. His search eventually turns the community inside out, as the frailties and long-hidden sins of the town and its inhabitants inexorably bubble to the surface.

Similarly, the last couple of weeks have been uncharacteristically bad for some of the big boys in the personal computer industry.

Last week, Lotus announced a six-month delay in shipping the eagerly awaited Release 3 of 1-2-3. At the same time, it was disclosed that Lotus's top managers unloaded more than a half million shares of Lotus stock just weeks before the shipping delay was announced.

Apple, feeling antsy about the encroachment of IBM hardware into its world of user-friendliness, sued Microsoft and Hewlett-Packard over their use of a graphical interface. The suit raised questions about the ability of Microsoft and IBM to bring the critical Presentation Manager interface to market on schedule this fall.

Then IBM and its Personal System/2s were the subject of a not-so-flattering front-page article in the *Wall Street Journal,* which painted the Micro Channel as being as much or more "an audacious marketing gambit" than the clone-proof secret ingredient of the PC of the future.

These companies and the woes they are experiencing have one thing in common: They are being victimized by expectations of their own creation. Caught between the realities of developing and selling increasingly complex products for an increasingly integrated computing environment on the one hand and Wall Street on the other, these firms had effectively staved off the bears by pointing to rosy visions of the future.

Only now the question is, Do these companies have the ability to fulfill their promises? Probably they do. While last week's news cast a pall over the PC industry, it was also a necessary cleansing process. Lotus has swallowed a bitter pill in admitting it cannot meet its deadlines, but it presumably has now set a date for the next version of 1-2-3 that it can live with. Microsoft and Apple will be forced into discussions that hopefully will produce a technology agreement both parties can live with. And IBM realizes it has much educating to do to convince a skeptical market that the Micro Channel is more than just a flashy marketing campaign.

There is a lesson here for the PC companies if they hope to avoid such damage to their images in the future. If those firms expect to compete in a maturing market, they must focus on customers and stop worrying so much about Wall Street. Statements of intention and product positioning have their place but are no substitute for deliverable products. Similarly, bickering between influential vendors only raises doubts among customers and threatens to drive them into another supplier's camp. It is difficult to feel sorry for any of the companies involved here. As Shakespeare wrote in *Julius Caesar,* the fault "is not in our stars, but in ourselves."

LETTERS TO THE EDITOR

Not all rosy

The report on IBM's earnings [CW, Jan. 25] was a textbook example of the effect of price cutting in a service business. The chart on IBM's revenue indicated that the company shot itself in the foot in the maintenance division. IBM's maintenance revenue grew at a miserly rate of 4%.

The chart indicated IBM enjoyed a growth rate of 17% and 21% for maintenance services in 1985 and 1986, respectively. However, in 1987, the maintenance revenue growth fell to slightly more than 4%. This is largely a result of the Corporate Service Amendment (CSA) to IBM's maintenance agreement. This marketing program had the net effect of reducing the maintenance revenue paid by IBM's mainframe customers by a minimum of 20% per year.

The announcement of the mid-range services amendment in the fall of 1987 can only spread the bad news to the balance of the IBM product line, the mid-range world.

The 1987 quarter-to-quarter comparisons make even worse reading for an IBM stockholder. The company managed to absolutely level the maintenance revenue in 1987 while it increased the pool of equipment eligible for maintenance by $34 billion, the value of the equipment it shipped throughout 1986. In effect, IBM has reversed the two-year growth curve of the maintenance division from approximately 19% per year to a negative growth curve after factoring in a $34 billion increase to the value of the equipment maintenance pool.

I assume that the marketing objective of the CSA program was to drive third-party competitors out of the business. To date, I have not seen any withdrawals from the maintenance business by any of the major companies, nor has there been any withdrawal of regional maintenance operations.

As a stockholder, an ex-IBMer and one who earns a living on the fringes of the IBM maintenance business, I only hope that the company does not aim any higher with maintenance policy changes this year.

Franklin J. Cona
Membership Director
Systems Maintenance Cooperative
Bradenton, Fla.

It can work

Reports of the apparent lack of IBM 9370 applications software [CW, Jan. 25] do not stand up to the test of reality.

In late December, Global Software, Inc. completed installation of a 9370. Immediately afterward, we installed one of our most popular products, Carms, which stands for credit and accounts-receivable management system. It was installed in less than a day.

The initial test of Carms was performed with seven users concurrently working against the most resource-intensive parts of the application. Two CICS partitions were active. Response time was excellent — consistently under two seconds. Batch processing was equally efficient.

This test goes a long way toward validating IBM's claims about system performance of the 9370.

At the same time, it is obvious to us that applications software must be efficient by design to perform well on the 9370. After-the-fact retrofitting — or as a vendor in the article said, "shoehorning" — will not get the job done.

Tight, well-written mainframe application code performs effectively on the 9370. And it dramatically displays the shortcomings of poorly designed programming.

Ronald J. Kupferman
President
Global Software, Inc.
Lynnfield, Mass.

Too exclusive

I am writing in reference to "Unisys confronts power of ² masters" [CW, Feb. 8].

Your so-called exclusive *Computerworld* survey in January must have been really exclusive. Since the Burroughs Corp.-Sperry Corp. merger, service to large former Burroughs mainframe customers in the San Francisco Bay area by both field engineering and marketing has shown a marked improvement from good to better. No one contacted our site for the "exclusive" survey. We have a Unisys Corp. A9F mainframe, more than 100 on-line terminals and a cadre of satisifed users. After talking with some of my MIS peers in the Bay area, I suggest you re-survey the Unisys user community for a more accurate picture.

Arnold D. Schapiro
Director, MIS
Orchard Supply Hardware
San Jose, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

'Butterfly Effect': Everything's a part

Hierarchical, reductionist managing won't work in our increasingly interrelated world

JOHN KIRKLEY

Butterflies. Airborne scraps of summer color moving through fields of flowers.

But there is more to butterflies than decorating the landscape, pollinating flowers and providing tasty snacks for hungry birds. They are also the basis for an analogy in weather circles that has implications far beyond the boundaries of that discipline — implications that may affect the way MIS professionals manage tomorrow's information systems.

I encountered the "Butterfly Effect" in James Gleick's fascinating new book, *Chaos*. In the prologue, Gleick writes, "The modern study of chaos began with the creeping realization in the 1960s that quite simple mathematical equations could model systems every bit as violent as a waterfall. Tiny differences in input could quickly become overwhelming differences in output — a phenomenon given the name 'sensitive dependence on initial conditions.'

"In weather, for example, this translates into what is only half jokingly known as the Butterfly Effect — the notion that a butterfly stirring the air today in Peking can transform storm systems next month in New York," Gleick writes.

The unfolding of this new science, peppered with unfamiliar terms like fractals, smooth noodle-maps, bifurcations and intermittencies, is beginning to profoundly affect the way scientists, and ultimately, all of us, view the world around us. "Chaos," Gleick writes, "breaks across the lines that separate scientific disciplines. . . . It is a science of the global nature of systems."

These scientists of chaos believe they are looking at the whole, rather than analyzing a system according to its parts, as the reductionists do.

Despite quantum physics, relativity theory, Heisenberg's uncertainty principle — despite

Continued on page 22

Kirkley is a computer industry writer, editor and consultant based in Warwick, N.Y.

Adjustable management mechanics

WILLIAM D. HARRISON

I began working in the computer field in 1960 as a systems engineer on a high-speed printer project at RCA.

At that time, high-speed printers were very expensive devices. The machine that RCA was developing printed at a rate of 600 lines a minute and cost about $50,000.

The engineering approach to designing the printer could be described as precision mechanics. The individual print hammers were manufactured to tolerances of one thousandth of an inch. Some of the early prototypes for the machines were made in Switzerland.

The basic design philosophy was to control print density and alignment by designing and manufacturing all of the printing components to precise specifications. There was one adjustment, and it was set at the factory.

The printer was a masterpiece of engineering, but it was not a great printer. Both print alignment and density drifted during printing.

Room for changes

While RCA was struggling to correct the deficiencies in its printer design, a small, entrepreneurial company took an innovative approach. Instead of producing parts to very rigid tolerances, this start-up added as many adjustments as possible to the printing mechanism.

The adjustments were used to compensate for variations in tolerances in manufacturing. The "adjustable printer" was very successful. It was also less costly than the RCA model.

Eventually, RCA phased out its printer and used the adjustable printer company as its supplier.

Adjustable solutions

After I became a manager in 1970, I saw the adjustable printer scenario repeated many times. The managers who had

Continued on page 22

Harrison is an engineering manager at Siemens Information Systems in Boca Raton, Fla.

Going the way of the whale

Don't let real programmers become extinct; support the creative ego

FRANCIS WALNUT

The programmer is an endangered species in the world of software development and may soon become extinct.

Programmers used to be software developers who did it all. They defined, designed, coded, debugged and maintained programs. They made the new phenomenon of "programming" into a craft, taking immense pride in what they created and being totally involved in what they did. Programmers, who lived to write good code and to see it work, were largely responsible for the great programming achievements of the 1950s, '60s and '70s.

Perhaps because managers are not able to cope with the artisan, they are eliminating the role of the programmer in software development and assigning the function to two autonomous groups: the Analysts and the Coders.

Analysts are individuals who talk knowingly about current computer science topics and who prepare diagrams and documents defining mythical systems. They like to be considered software designers only, and they abhor writing code. Analysts prepare voluminous detailed instructions defining how programs should be written and give these instructions to the pariah of the software community, the Coders.

Coders (often mistakenly referred to as programmers) write, debug and maintain programs according to the Analysts' instructions. Coders are limited to the preparation of sterile code, avoiding any creativity in either coding techniques or program structure. They are seldom aware of how their tasks fit into the overall system design, and management normally feels that they have no need to know.

A house divided

The frightening result of this divide-and-conquer approach is the elimination of programming expertise. That combination of skill, knowledge and understanding that allows the programming craft to become intuitive can only be achieved through many years of active program development and maintenance.

Once achieved, however, expertise allows a programmer to think in a programming language, conceptualize in terms of system design, know instinctively what will work and what will not for a given application and debug successfully through deja vu.

Programming expertise cannot be obtained with college degrees or through adherence to structured design concepts; it can only be obtained through grassroots programming experience. This type of experience is now considered unimportant, and it is only a matter of time until programming expertise disappears.

Misplaced leaders

As a result of the demise of programming expertise, programming leadership is gradually being replaced by software management. Programming leadership assumes that the people in charge are expert in their area of supervision; software management assumes that successful supervision requires only the ability to monitor, motivate and administrate.

LES KANTUREK

Programming expertise is actually considered a detriment to successful software management because it is felt to detract from the esoteric management techniques.

Recently, when a software manager bragged that his technical credentials consisted of the fact that he had written "one program that never worked" he was applauded — by other software managers.

Although it may be true that a preoccupation with technical details may interfere with successful management, it is equally true that only programming expertise can provide a realistic knowledge of what is required to get things done and an understanding of how to do them.

Often when there is management without expertise, logical program implementation is replaced by protective memos and irrelevant schedules.

In addition, the new software management philosophies are destroying dedication and pride of achievement, which were the programmers' driving forces. Each individual in a modern software development organization has his or her isolated function and is effectively buffered from any responsibility for the finished product.

Meeting artificial deadlines becomes their primary concern, and quality assurance becomes merely the function of another group in the organization.

We are now producing "egoless" programs using the same management philosophy that had Detroit producing egoless automobiles a few years ago. That philosophy almost put Detroit out of the automobile business, and it may well put us out of the software development business.

The programming expertise, leadership and dedication represented by the innovative programmer is essential for the successful completion of any significant programming project. Those of us who lived through the implementation of OS/360 are willing to admit that it represented a great managerial achievement, but we also feel that it represented a triumph for the innovative programmer.

Although the writing of the individual parts of OS seemed to go well under management control, serious problems were encountered when we tried to put the system together. Nothing seemed to fit.

It was then that the innovative programmers took over. They added a little here, took away a little there, redesigned a little, rewrote a lot and worked such long hours that it became a corporate concern. Innovation and creativity were everywhere. And OS/360 was born.

I often wonder if OS would ever have seen the light of day if egoless programming had been in vogue 20 years ago.

"But," we declare, "it took us 10 years to get the programmers out of their sneakers and jeans. We have finally convinced them that program design is an architectural exercise and that coding is merely a clerical activity. Perhaps we still cannot produce programs efficiently, but at least we are in control."

This obsession with control has ruined many healthy businesses and is now threatening to

Continued on page 22

Walnut is president of Documentation Research in Drexel Hill, Pa., a company that prepares programs and consults on automated documentation.

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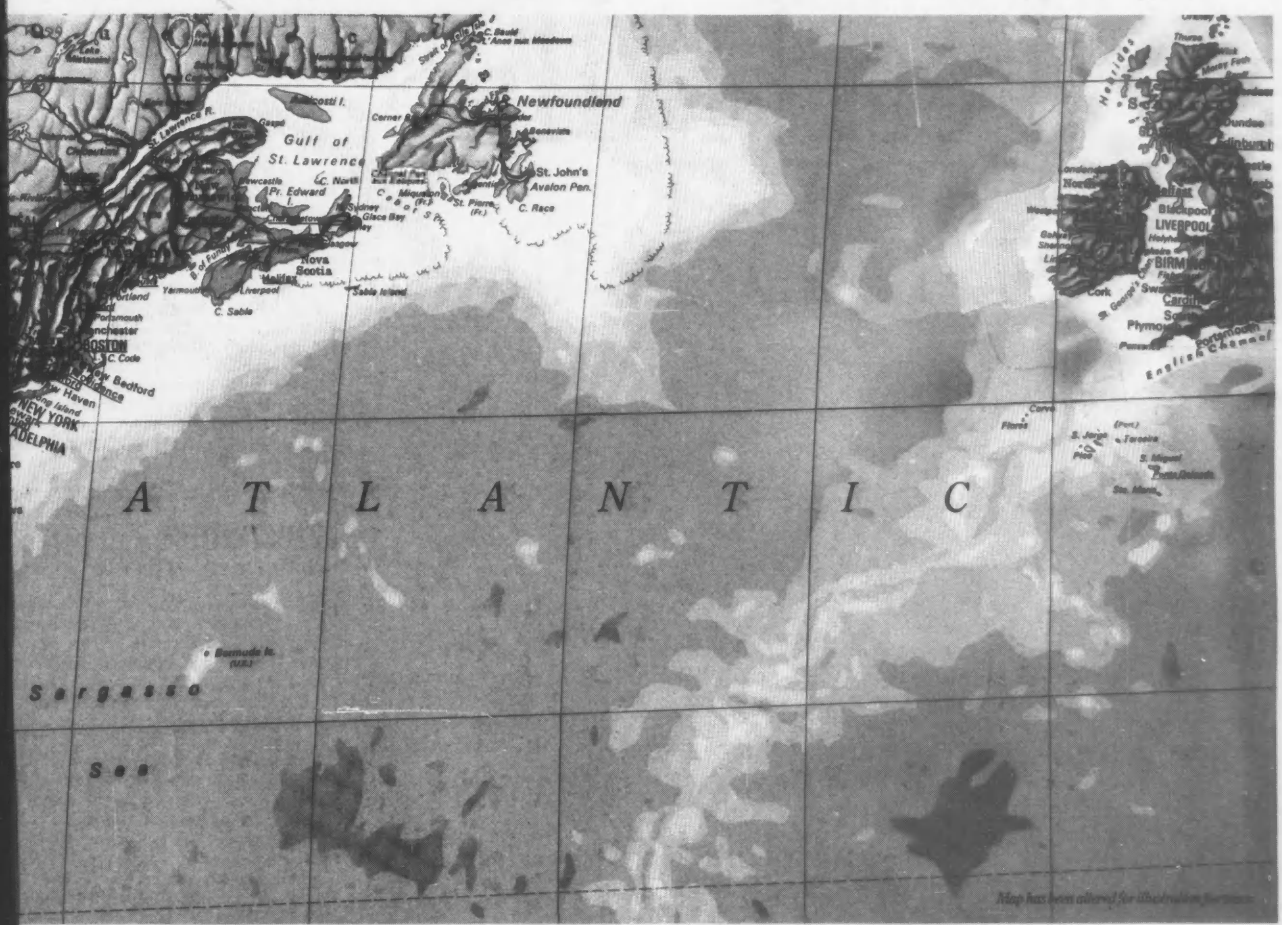

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Butterfly Effect

CONTINUED FROM PAGE 19

discoveries that the universe we inhabit is paradoxically more simple yet infinitely more complex in its interdependent interconnections than we imagined — we still carry with us the useful yet burdensome baggage of world views grounded in Cartesian rationality and Newtonian physics.

In many ways, we still see the universe as a great machine put in motion by some celestial engineer. To understand the machine, we need only unravel the secrets of its parts. In addition, we see ourselves as separate from the people and the world around us. We stop at the boundaries of our skin; beyond that, all the rest begins.

Physicist Geoffrey Chew is known for the "bootstrap hypothesis." As explained in *The Tao of Physics*, by Fritjof Capra, this hypothesis postulates that "nature cannot be reduced to fundamental entities, like fundamental building blocks of matter, but has to be understood entirely through self-consistency. This bootstrap philosophy . . . accepts no fundamental entities whatsoever — no fundamental concepts, laws or equations. The material universe is seen as a dynamic web of interrelated events. None of the properties of any part of this web is fundamental; they all follow from the properties of the other parts, and the overall consistency of their interrelations determines the structure of the entire web."

Perhaps eventually the interrelatedness of all things will creep into our collective consciousness, replacing the Newtonian notions of separateness and reductionism. There are already signs in our own field of computer technology that this change is happening. There is the development of groupware — software that permits people, all connected by networks and personal computers, to share ideas, exchange comments, develop projects and, in general, go about their business not so much as separate entities but more as parts of a collective whole.

And then there is the fast growing area of distributed network computing. We're already taking the first steps with Sun Microsystems' Network File System, DEC's Decnet System Services and Apollo's Network Computing System.

These networking schemes not only provide the benefit of load-leveling across computer resources but make it possible for users and their equipment to concurrently access multiple servers on the network. This interaction, in turn, leads to the promise embodied in yet another new computer industry catch phrase, Computer Supported Cooperative Work.

Users weaving webs

With or without the help of MIS, users are beginning to mold themselves into interrelated webs of cooperative enterprises. In the workplace, they are beginning to emulate the world view implicit in tomorrow's physics.

MIS managers who attempt to manage the evolution of information systems from the old Cartesian view of a hierarchical, reductionist world will find themselves totally out of phase with their users.

And what of butterflies? The wise MIS manager will help facilitate this increasing interrelated web of user interaction. He will remember that in a holistic world, a small perturbation in one part of the system can lead to massive perturbations somewhere else.

Tomorrow's savvy network managers will be not only know their protocols, they'll be minding their fractals as well.

Way of the whale

CONTINUED FROM PAGE 19

destroy the software development business by eliminating the programmer.

Since the programmer is at least as important as the whale, we should embark immediately on a "Save the programmer" crusade.

We should resurrect the concept that creativity at the coding level is desirable, encourage the development of programming expertise, develop programming leaders and put the ego back in programming.

Above all, we must learn to work effectively with the programming craftsman and avoid the tendency to destroy what we do not fully understand.

If, however, we are unwilling to take these steps, let us at least be kind to all the programmers we may meet. They feel neglected and betrayed. So, be nice to a programmer today — if you can actually find one.

Mechanics

CONTINUED FROM PAGE 19

the highest failure rates always planned in a precise manner, down to the smallest detail. They also implemented rigid controls over each task in product development.

The most successful managers produced a solid overview but rarely planned in detail beyond a three-month period. Limiting detailed planning appears to provide flexibility to respond to the many unforseen events that can occur during product development. It also seems to help software engineers focus on today's problem rather than worry about a task that need not be done until far in the future. The successful managers used "adjustable solutions."

As one successful manager said to me, "I love to make plans. It gives me something to change."

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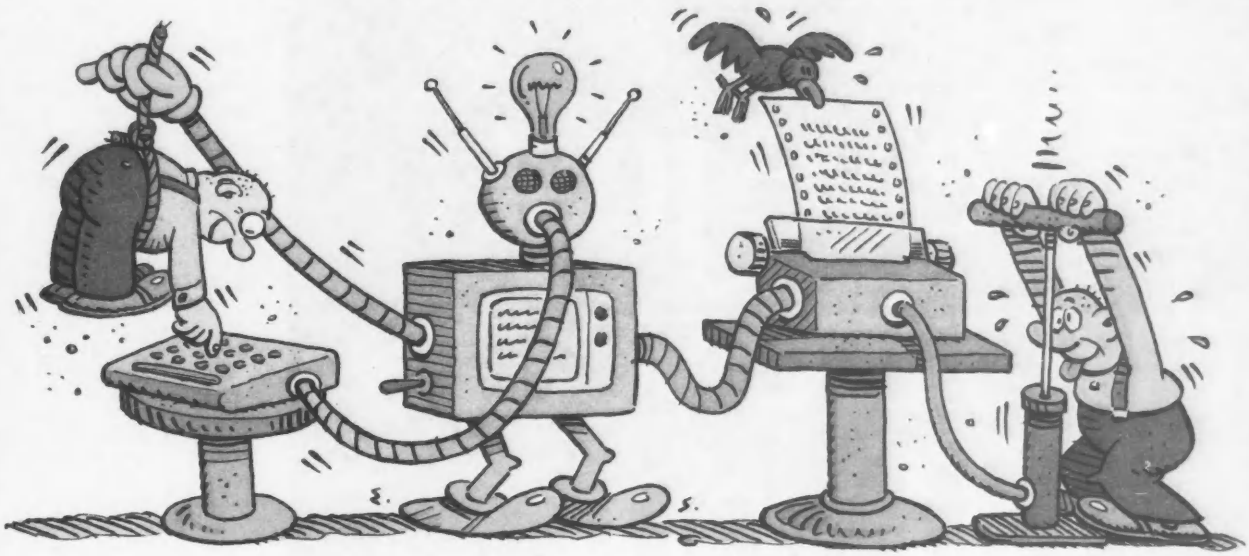

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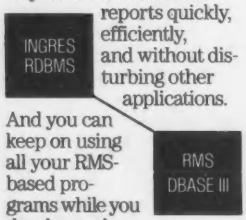

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SOFT TALK

Thomas O'Flaherty

CASE's next generation

The next generation of CASE? Most of us haven't yet digested the hundred — give or take 25 — CASE products available.

Actually, many organizations need the next generation right now. Few computer-aided software engineering, or CASE, products promise coverage of the entire software life cycle. A less obvious but equally limiting defect is the lack of a way to fit previously developed, non-CASE applications into a standard CASE environment.

The next CASE generation, CASE II, will be differ in the following ways from what we now think of as CASE, both functionally and in how CASE presents itself to users:

• Full, integrated functions. The larger CASE vendors have already begun a kind of "race to the sea" whereby a customer would get support for all life cycle components from a single, integrated source.

• Mix and match. This will allow customers to implement the CASE phases they feel ready for, while having assurance that other CASE modules will be available when needed.

• Methodology support. CASE tools and implementation are driven, at least implicitly, by a particular approach to sys-

Continued on page 29

Bachman on direction of DBMS

Software guru sees users adopting multiple data base approach

In a recent interview, Charles W. Bachman, president and chief executive officer of Bachman Information Systems, Inc. in Cambridge, Mass., outlined where he sees data base management systems headed in the near future.

Bachman is the originator of the Bachman diagramming technique and recently received a patent (his 17th) for a data translation model. He spoke with *Computerworld*'s Joanne Kelleher, senior editor of *Spotlight*.

In what direction do you see DBMSs heading?

I think we are building toward a point where, instead of one or even two data base systems, people will have a family of them installed on their computers and will choose the one they think is appropriate for each application.

There was a time when there was a great fervor about whether relational systems or hierarchical systems or network systems were right. There have been some great debates on the subject. But I think that is passing. In the future, there won't be an all IMS shop or an all IDMS/R shop or an all VSAM shop.

People want to look and say, "What information does the business need, and how shall I implement it?" And they really want to hold off the decision to bind to a particular data base system as late as possible.

Are there any limitations in the current models that you think could and should be rectified?

I think we have maybe reached a stable point. While there are things that could be done to the data models or a lot of the current data bases that would make them better, maybe it wouldn't be enough . . . to move people from where they are.

Some of the current models have their known inadequacies, but they also have their known behaviors. And people will not move easily to something new, unless it offers them a substantially larger benefit.

Charles W. Bachman

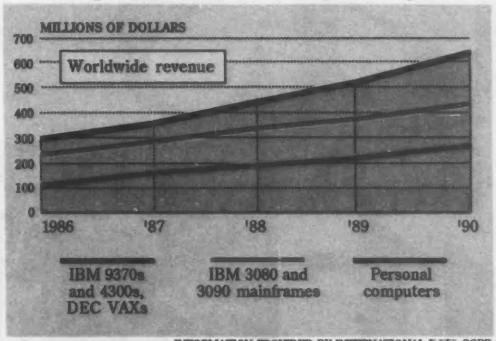
That higher level of specification you are referring to is the Partnership Data Model, for which you recently received a patent. Can you describe what that is?

Continued on page 30

Data View

Accounting software use rising on nonmainframe platforms

Use will grow faster on PCs and minicomputers through 1990



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

Mainframe Unix to get SAA bridge

BY CHARLES BABCOCK
CW STAFF

IBM's version of Unix for the mainframe, AIX/370, contains features that originated with smaller companies and have been adopted by IBM to provide interconnectivity, the company revealed recently.

In addition, AIX/370 and IBM's proprietary software architecture, Systems Application Architecture (SAA), will have bridges between them, even though they represent two worlds of software that will remain distinct for many years.

In one instance, a Unix- and Ethernet-based communication protocol — Transmission Control Protocol/Internet Protocol (TCP/IP) — will not only be offered across the entire AIX/370 line but will also be extended to the IBM MVS and OS/2 worlds, company officials said.

Continued on page 29

Inside

• Unitronix offers manager for its Praxa system. Page 32.
• Computer Translations reworks converter, adds ability to run on VMS systems. Page 32.

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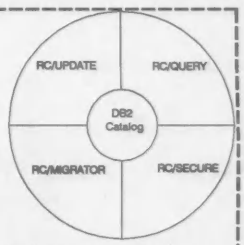

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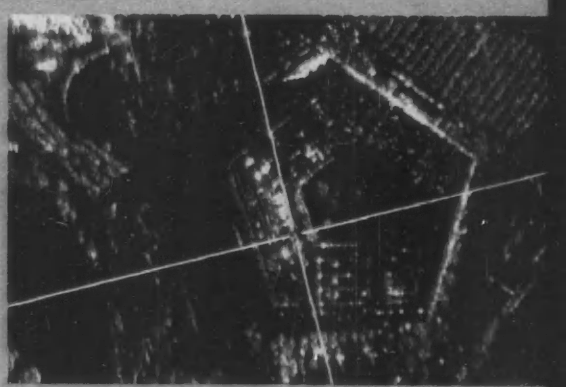

While developing software for the B1-B Bomber radar system, Westinghouse Defense landed on a tough problem – integrating its computer resources. "We needed a complete network that would allow hundreds of software engineers across the country to interact, create, enhance and modify the software," says Ron Clanton, Manager of Software and Information Systems.

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"But our savings don't stop there," continues Clanton. "With the VAX™ architecture and the VMS™ operating environment, engineers both on the ground and in the air can react instantly to each other's modifications." He adds, "That's sharing their knowledge and expertise faster and more productively than they ever thought possible. Which, of course, provides for a better end product."

Clanton sums it up this way, "Our Digital network and The Flying Software Lab allow us to cut software development time and costs across the board. And that's increasing our productivity and ability to compete for similar projects."

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O'Flaherty

CONTINUED FROM PAGE 25

tem development that permeates a particular CASE approach. Vendors now generally adopt one of two approaches: offering a single proprietary design philosophy or allowing a user to interface with a methodology of the customer's choice.

In the future, vendors will have to support, say, two to four design methodologies — enough to give users reasonable choices without placing unrealistic support requirements on the vendor.

• Integrated restructuring. Having full, integrated CASE functions will be important for new systems but won't be of much help to the many organizations with huge investments in already operational systems. Finding ways to redevelop in place is often of higher priority than finding elegant ways to build totally new systems.

Future CASE tools will have to be time travelers, enabling customers to go back into an older system to restructure it into at least a semi-CASE environment.

• End-user CASE. Many CASE vendors stress the necessity of end-user, and even top management, involvement in the CASE development process. Unfortunately, they provide little advice in mobilizing end users; too many CASE tools seem to depend on system-friendly users rather than user-friendly systems. The next CASE generation will have to, at a minimum, hide a great deal of current technical interfaces and/or add another layer of business-oriented interfaces.

• Consulting plus software. The current CASE focus has been, quite legitimately, on CASE tools and methodologies. The problem for typical users is not so much learning how to use a product but figuring out how it should be used. CASE will only prosper in most organizations when it is not just a software product but a way of life.

At the least, a customer will usually have to be assisted in implementing several medium-size projects. Since CASE at its most mature is a disciplined way of organizing an enterprise's data resources, a vendor may well continue to supply the CASE "shock troops" to keep CASE pointed in the right direction.

Implications

CASE has significant implications for both customers and vendors:

• Standards. Interface standards, between both functional models and design representation systems, will be both a cause and effect of CASE advancing to its next generation. The lack of enthusiasm for the CASE standards group of the Electronic Industry Association shows this will not happen overnight.

• Investment. CASE II will be expensive and take substantial time to develop. The investment is not limited to vendors, since a full-fledged CASE environment will be costly in time and money for users to implement.

• Consolidation. Large investments in product development and distribution suggest that there will be a natural drift toward forming a relatively few large vendors that are strong both technically and financially.

O'Flaherty is a principal of Information Service Strategies, Manhattan-based consultants, and specializes in information systems planning.

Mainframe Unix

CONTINUED FROM PAGE 25

Also, IBM users implementing SAA with LU6.2 "might find that protocol helpful to have in the Unix environment. Although LU6.2 might not become a Posix standard, our intent is to provide our customers an LU6.2 communications vehicle so that data from the SAA environments can be incorporated into AIX," said George H. Conrades, senior vice-president and general manager of IBM's Personal Systems Division.

Thus, the primary communication protocol of the respective software architectures will have a bridge into the other, otherwise largely incompatible, world, explained Thomas K. Dow, AIX product manager in IBM's Data Systems Division in Kingston, N.Y. No time frame was set for either move, but Dow claimed the TCP/IP initiative is not very far away.

One feature of AIX, its Transparent Computing Facility (TCF), originated with Locus Computing Corp. in Santa Monica, Calif. TCF allows the creation of a TCF cluster that offers "a single system image" to an application program or user on the cluster, Dow said. The cluster can include up to 31 nodes connected by an IBM Token-Ring, an Ethernet local-area network or an IBM Channel-to-Channel Adapter. Files may be accessed from any node, and a system operator can designate different processors for various tasks to distribute the work load on the cluster, IBM said.

A single, distributed, hierarchical file system is featured in the TCF cluster. If an AIX user at one location cannot find a file at his departmental IBM 9370 data base, his query can be automatically rerouted to a mainframe or other processor where the data base has been replicated, according to system operator specifications.

A second option under AIX/370 that was developed outside IBM is Network File System (NFS), a Sun Microsystems, Inc. protocol enabling AIX/370 to work with other Unix systems connected via an Ethernet or Token-Ring LAN. NFS is a separately licensed program set to become available at the same time as AIX/370 in March 1989.

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Bachman

FROM PAGE 25

At a time when people were trying to understand how data bases operated, there was a considerable amount of research work done under the auspices of the ANSI organization. One of the problems they attacked was the question of what they called data independence.

First, they came up with a conceptual schema, which was a view of the information in a business independent of how it might be stored in a data base or, in fact, how it might even be kept in paper form.

Then, the next step was to come up with a way of describing the information that transcended specific coding dialects.

So the Partnership Data Model was created not to be the basis for another data base system but to be a basis for translation — a Rosetta stone of data models, if you want to think of it that way.

It gives you the power to understand what is going on in the other models, so that someone can map a description in IMS or [IBM's] DB2 or [Cullinet Software, Inc.'s] IDMS onto the Parnership Model and then translate it back to a different model, without the loss of semantics.

How does the Partnership Model relate to your company's new products, Data Analyst and Database Administrator?

The Database Administrator is not one product but several modules. The first module was designed to work with IDMS. Two others — one for DB2 and another for Cobol files — will be delivered this fall.

At that level, the product is very much implementation-oriented, very much directed toward optimizing designs of data bases.

The product that sits just above those is the Data Analyst product, and it was designed to be independent of any of the four programming languages or data base languages below it. So you can capture data descriptions in these traditional data base languages and file processing languages and actually reverse-engineer them to bring it up to a higher level of abstraction.

That is the point at which we use the Partnership Data Model.

We would factor out all the peculiarities of both a particular data base system to create a form that is more specific to the business requirement. When you take a logical and conceptual design from that level forward for implementation, you translate that idealized level into the programmatics of whatever data base systems model you want.

Is the Partnership Data Model an expansion of or a replacement for data dictionary products?

It is an expansion on that concept and one that tends to make it a much more active concept. Beyond the definitions, there is a very close tie back to actual files being maintained in those various forms.

How real do you think distributed DBMSs are at this stage?

To begin with, I think you have to differentiate between having multiple data bases and having a

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single data base that treats information stored in multiple locations as if it were all one set of information.

The key distinction is in consistency control. If you have more than one data base, then it is the responsibility of something outside the data base management system to keep the two or 10 or a thousand data bases consistent.

If you have a distributed data base, it is up to the data base management system to make sure that when information is changed in one place, it is also appropriately updated wherever else that information is stored.

In that sense of a distributed data base, I see very little going on. I hear about military systems that have done a lot of this, and you read a lot of research papers, but I have not met anybody from a large U.S. corporation who talked to me about having a distributed data base by that definition.

What about the products that are advertised as distributed DBMSs?

I think that what is really happening is that some companies with regional centers are doing things like running identical programs against identical data bases — but with regional partitioning of information. But that really isn't a distributed data base, because if you want information about a Michigan customer, you still have to call the Michigan office.

What do you think of relational data bases acting as a platform for connectivity across various systems?

If someone has implemented the same basic system from very small machines to very large machines, then it is much easier for someone to think about moving files between those machines. And it is a matter of fact that the current strong vote for data bases is to move in the relational direction because it is easier to think about, in some sense, using the relational view.

The thing we know, though, is that it is much more difficult to design an efficient relational data base than it is to design one for a more traditional data base — like a network one or a hierarchical one. And the reason is that the thing that makes relational [DBMSs] easy to use is the fact that they don't require certain information, which means that you are given fewer cranks or handles to manipulate if you are trying to deal with efficiency.

So you don't think that relational systems are the real answer for multivendor connectivity and distributed DBMSs?

The reason why relational data bases may be the way to do that today is because relational data bases are the ones that are currently being commercialized for all sizes of computers. Therefore, it is easier to get the same standards on big and small machines than it would be with more traditional things.

It is the commercial reality that makes it work and not the particular advisability or unadvisability of relational systems.

What is your alternative?

By understanding the semantics of each data model, we avoid the necessity of going to a single physical data base system.

You can take what is a hierarchical file on a mainframe and, when you want to migrate that to files distributed on 10,000 minicomputers, just go through the reverse-engineering to convert the hierarchical file description into the Partnership Data Model. Then forward-engineer it to the relational system, and you are ready to go.

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Systems software

Interactive Software Services, Inc. has announced a management information tool, **Amis**, that builds models of a business using existing data.

Amis is a three-dimensional modeling system that runs on IBM System/38 minicomputers and is fully integrated with IBM Personal Computers. According to the vendor, the user designs the relationship linking sets of data, and Amis builds the model. The user can redefine changing relationships or change their relative importance. A report writer generates user-defined hard-copy records.

Two compatible versions are available: Amis/38, priced at $35,000, runs on the System/38; Amis/PC, priced at $1,500, includes networking software and runs on IBM PCs and Personal System/2s.

Interactive Software, Suite 306, 4825 N. Scott St., Schiller Park, Ill. 60176. 312-671-4450.

An optional information manager feature has been made available by **Unitronix Corp.** for its **Praxa** integrated manufacturing application system.

The **Praxvu Information Manager** allows users to access, report on, edit, update and manipulate information contained in the Praxa system files.

It consists of seven components: a report generator, a fourth-generation inquiry language, predefined views that link related elements from multiple Praxa applications, a data dictionary, an individual record-edit facility and a mass record-update facility as well as a data formatting utility.

Praxvu is designed for use with RMS files in the Digital Equipment Corp. VAX/VMS software environment.

It costs between $2,125 and $11,000 depending on host VAX.

Praxa costs between $3,000 and $12,000 per module.

Unitronix, 1021 Centennial Ave., Piscataway, N.J. 08854. 201-981-1600.

V/SEG stretches the capabilities of your VM DCSS system, not your system programmers.

PROFS...SAS...APL...GDDM...ORACLE...FOCUS. More and more of today's important VM products require Discontiguous Saved Segment (DCSS) facilities.

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Install DCSS-resident software in as little as 15 minutes with no service outages.

Tired of having your programming staff spend hours on each DCSS product installation or update? V/SEG's Dynamic Update feature not only simplifies the installation and maintenance of DCSS-resident software, it also lets you update on the fly with no IPLs and no need to schedule weekend service outages.

ALIAS ASSIGNMENT

Test new software releases without having to shut down your current production version of the product.

Have you ever compromised new software testing because DCSS are so uncompromising? V/SEG's Alias Assignment feature provides a DCSS renaming capability that allows you to thoroughly test new software releases in parallel with your full production versions—something that is normally impossible with DCSS-resident programs. Not only that, but most testing is transparent to the users and faulty versions can be easily backed out while corrections are made.

AUTOFIT

Prevent an overlapping of DCSS in virtual memory.

Would you like to decrease the time spent planning and managing DCSS definitions while increasing user satisfaction? V/SEG's Autofit feature automatically scans multiple copies of a DCSS program to find a copy that won't destroy another DCSS in a user's virtual machine. This greatly reduces the planning and management normally associated with DCSS definition and maintenance.

In addition, V/SEG creates a visual display of DCSS by virtual storage. This improved mapping utility cuts the time needed to allocate new saved systems and to adjust the location of existing ones.

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Not only will it save time and money by dramatically improving your VM programming staff's productivity, it will totally change what you thought you could do with DCSS. And over the long stretch, that's good for your entire company.

PROFS—registered trademark for IBM Profesional Office System. GDDM—registered trademark for IBM Graphical Data Display Manager. SAS—registered trademark of SAS Institute, Inc. Oracle—registered trademark of Oracle Corporation. Focus—registered trademark of Information Builders, Inc.

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VM SYSTEMS GROUP

Utilities

Computer Translations has enhanced its **VM77** converter to run on Digital Equipment Corp. VMS-based systems.

VM77 is a conversion tool that identifies and converts nonstandard DEC extensions in Fortran programs, producing portable Fortran code that conforms to the ANSI-77 Fortran standard.

Additional enhancements to the DEC extensions have been added into the VM77 converter, including Associate Variable, Find and Rewrite, Logical Inside If, Close Options, Define File and Byte Data Types.

A license for a single system costs $3,500.

Computer Translations, 2235 W. Potter, Phoenix, Ariz. 85027. 602-582-9515.

GT Software, Inc. announces **Release 2.1** of **Assist/GT**, a productivity tool for use with CICS.

Assist/GT allows Help windows, Help screens and on-line manuals to be added to CICS applications without program modifications.

Release 2.1 adds an exit allowing data to be obtained directly from existing CICS files and placed into a Help display. Also available is the ability to define the size and location of a Help window.

Release 2.1 also offers a data stream compression feature and a memory feature designed to simplify tasks of the CICS System Administrator.

Assist/GT costs $5,500 for VSE/SP and $6,900 for MVS/XA.

GT Software, 1111 Cambridge Sq., Alpharetta, Ga. 30201. 404-751-1400.

Integrity Solutions, Inc. announced enhancements to its automatic journal archiving product, **JMS/Switch.**

JMS/Switch Release 1.2., designed to secure vital on-line VSAM data, addresses on-line CICS journal management requirements by providing automatic journal archiving.

The product's job submission selectivity capability has been enhanced to allow user-specified submission of different jobs based on the phase of CICS execution. It also includes a symbolic parameter feature that allows use of the same set of JCL and processing options for multiple CICS regions or journals.

It also includes a series of on-line, real-time status displays and a function that can automatically activate an interval control timer to force a journal switch for selected journals.

JMS/Switch licenses for $4,500.

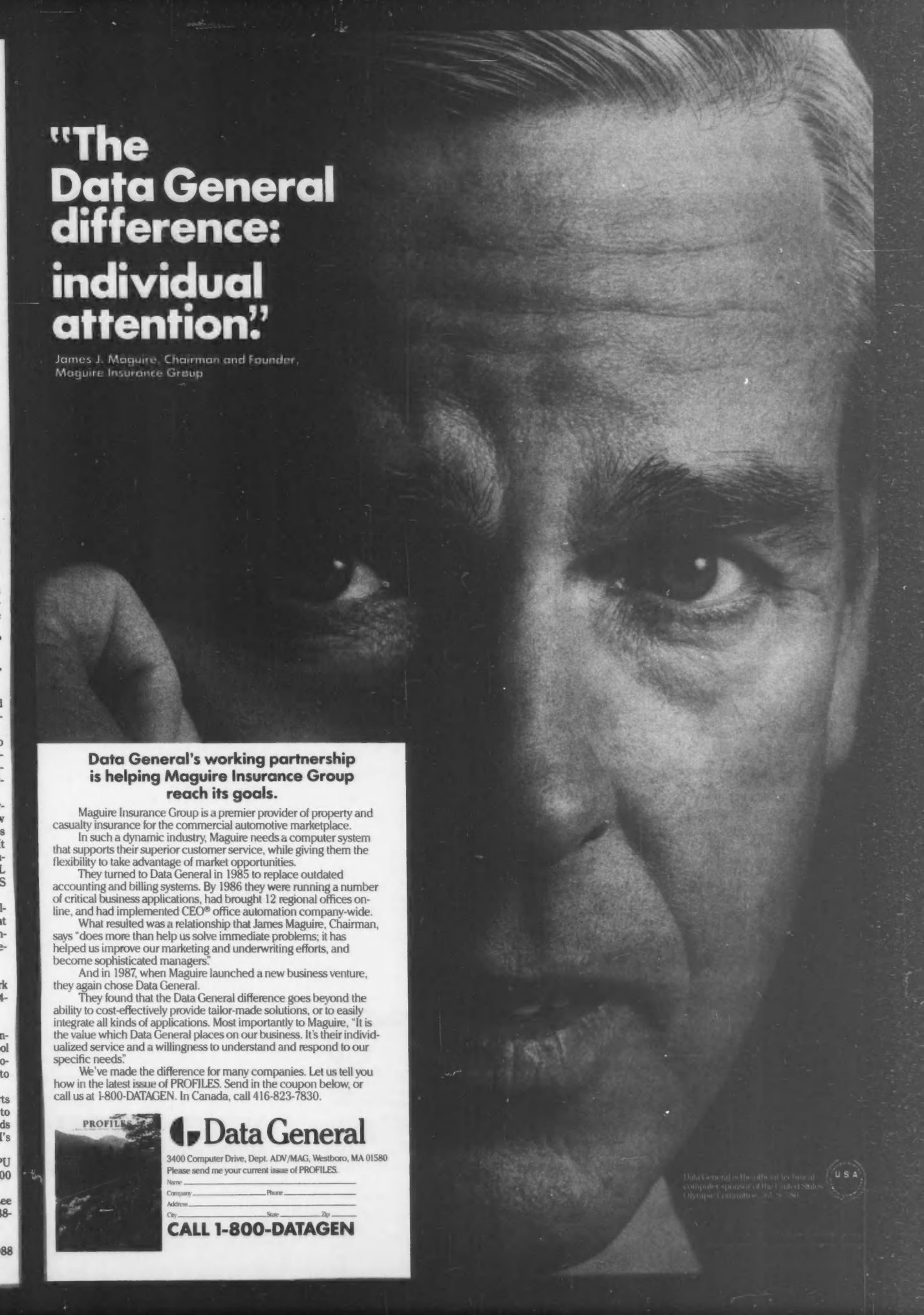
Integrity Solutions, 7921 Southpark Plaza, Littleton, Colo. 80120. 303-794-5505.

Interactive Solutions, Inc. has enhanced its **Ads** testing and debugging tool to provide the ability to directly insert Cobol code into a session without having to recompile the program.

According to the vendor, Ads alerts CICS users when a program attempts to access storage that it does not own. Ads supports Cobol II, CICS 1.7 and IBM's MRO, DOS and MVS/XA.

Ads costs $19,900 for an IBM OS CPU license; the product is priced at $14,900 for DOS.

Interactive Solutions, 53 W. Fort Lee Road, Bogota, N.J. 07603. 201-488-3708.



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MICRO BITS

Ed Scannell

Nice suit you got there

Fighting over the pot of gold. Apple's suit against Microsoft has resurrected some interesting, and perhaps important, stories about the work that Steve Jobs and Bill Gates did in developing the Mac interface. The story goes that Gates was one of the first people Jobs turned to when he had a prototype of the Mac up and running. Gates reportedly gave Jobs some advice on creating the Macintosh interface and also put some features in Microsoft applications that became part of that same interface.

Two years ago at a Comdex party, according to one source, Gates talked about the technology exchange agreement he was about to sign with Apple over the licensing rights to the Mac. Our source says Ol' Bill was rather ticked off that he had to sign such an agreement, since he felt his contribution gave him co-developer rights.

While no one knows for sure, chances are there is nothing in writing between Jobs and Gates saying who did what work on the interface. Unless either Jobs or Gates is willing to make public what actually transpired be-

Continued on page 44

HP sees daylight in lawsuit cloud

Dismisses Apple's claims, continues development of New Wave

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Third-party developers said last week that they are confident Hewlett-Packard Co.'s New Wave application environment is going to be an important microcomputer architecture in the future, regardless of the recent lawsuit by Apple Computer, Inc.

"We will continue our development efforts for New Wave," said Nancy Haydt, director of software engineering for Forum Systems, Inc. in Santa Barbara, Calif. "The Apple lawsuit is not going to change any of our plans."

On March 17, Apple filed suit against Microsoft Corp. and HP, charging that Microsoft's Windows 2.03 and HP's New Wave infringe on the "look and feel" of Apple's own graphic user interface [CW, March 21].

HP dismissed Apple's claims as unfounded and said it "intends to oppose the suit vigorously." In the meantime, the notorious lawsuit may actually generate additional interest in New Wave, according to Robert J. Frankenberg, general manager of HP's Information Systems Group. "We've had a lot of calls and responses since the suit from developers who weren't that familiar with New Wave and wanted to know more."

There is a good deal of excitement among developers regarding New Wave; developers say its object management and agent facilities go far beyond Apple's own technology. "For that reason alone, New Wave is not likely to die quickly on the vine," according to Sonny Margolis, president and chief executive officer of Computrac, a third-party developer in Dallas.

Indeed, momentum was high at a New Wave developers' conference held the day before the Apple lawsuit was announced.

New Wave is "24 months ahead of any graphical environment in its integration capabilities," said Christine Hughes, analyst with the Gartner Group, Inc. in Stamford, Conn.

Developers seemed more concerned about compatibility issues than Apple's lawsuit, in fact. In the corporate environment, for example, "a lot of programmers will have a problem" switching from Microsoft Corp.'s C code, in which most microcomputer software applications are written, to New Wave's object-oriented code, ac-

Continued on page 44

Firm finds antidote for PC virus

BY ALAN J. RYAN
CW STAFF

On May 13, 1988, computers all over Israel were set to be the target of an attack.

The so-called Israeli computer virus, designed to destroy all data on the hard disk of host systems, was fortunately discovered before it could perform its foul mission. But now all of the software programs it infected must be identified, and time is running out.

The Israeli scenario, related by John McAfee, is not all that uncommon. McAfee is president of Interpath Corp. in Santa Clara, Calif., a company that has developed an antiviral shield for IBM Personal Computers and compatibles. The product, C-4, is set to ship next month.

For Apple Computer, Inc. Macintosh users, CE Software, Inc. in Des Moines, Iowa, recently put its Mac Vaccine antivirus program out on electric mail services.

The figures on computer vi-

Continued on page 43

Data View

What you get out of micros

Boosting productivity is by far the prime benefit of microcomputer use, according to a survey of 2,500 systems professionals

	Number of replies	Percent of responses
Improves productivity	1,589	73%
Makes work easier	1,011	47%
Improves quality of work	937	43%
Improves information about business	645	30%
Reduces labor costs	411	19%
Improves organization of business	387	18%

INFORMATION PROVIDED BY THE ASSOCIATION FOR SYSTEMS MANAGEMENT
CW CHART

G-2 develops chip for PS/2

BY JAMES A. MARTIN
CW STAFF

MILPITAS, Calif. — G-2, Inc., an independent subsidiary of LSI Logic Corp., is set to announce this week an IBM Personal System/2 Model 30-compatible microprocessor that reportedly offers faster CPU speeds and greater OEM design flexibilities.

The 10-MHz chip is compati-

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Inside

- Apple's Gassee shares his vision. Page 37.
- The ups and downs of Quickbasic 4.0. Page 37.
- Oak Park Software adds time scheduler. Page 45.

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SMALL TALK

William Zachmann

OS/2, PS/2: One year later

When IBM introduced the Personal System/2 line of personal computers in April 1987, the OS/2 operating system was presented as an integral part of the announcement. It was easy for the casual observer to believe that OS/2 and PS/2 were intimately related to one another.

The rosy impression many got from IBM's advertisements and commercials was of a new line of personal computers designed for a new operating system. There was lots of talk about dramatic new developments in software resulting from OS/2.

Now it is a year later. IBM OS/2 Standard Edition 1.0, the initial release of OS/2, has been available for several months. And to the surprise of many, the impact of OS/2 on personal computer use rounds off to zero. There isn't any sign of the software millennium that the first flush of "/2" enthusiasm seemed to foreshadow.

By now, hopefully, everybody knows that there isn't really any more link between OS/2 and IBM's PS/2 than there is between OS/2 and everybody else's Intel-based personal computers. In fact, roughly six out of every 10 PS/2s shipped so far can't run OS/2 at all.

Continued on page 42

Apple's bubbly philosopher sees fun and fortune as the company grows up

IN PERSON

Jean-Louis Gassee can be called Apple Computer, Inc.'s resident philosopher. The 44-year-old vice-president of research and development peppers his speech with phrases like "the gestalt of the system." He refers to Apple not as the more than $2 billion company it has become, but as an entity with a soul.

This June, Gassee celebrates his 20th anniversary in the computer industry. "I've heard a lot of buzzwords," he says of the last two decades. "I've said some stupid things myself."

Recently, Gassee discussed his unique vision with *Computerworld* West Coast senior correspondent Julie Pitta. However, what he won't talk about is Apple's nemesis in the personal computer market — IBM. "I have the very un-American attitude of not talking about the competition," Gassee explains.

Jean-Louis Gassee *charts Apple's plans for the next decade*

What will result from Apple's relationship with Digital Equipment Corp.? Is it a policy statement or will we see co-developed products resulting from the agreement?

We will have a developers' conference in August and will come out with the full specifications and product suite at that time so that developers can play in the framework that Digital and Apple are establishing. Digital will develop services inside VMS to serve Apple protocols. We'll provide a DEC windows server inside the Macintosh and VAX nodes and VAX mail agents. We'll provide a router box that connects the local talk cable to Ethernet. That is decided. What we have to provide are the technical specifications so that third-party developers, who have made us who we are, can provide the best applications for that environment.

IBM appears to have learned some lessons from Apple, such as the

Continued on page 43

Excel's high performance too high priced for many

BY STEPHEN JONES
CW STAFF

With all its advanced systems requirements and added overhead, Microsoft Corp.'s Excel could be called the spreadsheet of the rich and famous — well, at least the rich.

While the Microsoft MS-DOS version of Excel boasts exceptional graphics capabilities and souped-up functionality, widespread implementation of the product can prove to be a costly endeavor for MIS. Users and analysts contacted by *Computerworld* said a major drawback of the program is that it carries too much baggage for simple installation.

In addition to plunking down $495 for the Excel software, the user has to have an Intel Corp. 80286- or 80386-based machine, about 2M bytes of additional memory, a high-resolution monitor and a graphics card — not to mention a high-resolution printer to output the improved graphics.

Price not right

The cost of memory upgrades alone can be prohibitive when multiplied across hundreds or thousands of machines in a large corporate MIS shop.

"I wish it wasn't such a memory hog," lamented Liam Egan, director of end-user computing at Dean Witter Reynolds, Inc.'s financial services group in New York.

But that has not stopped Egan and customers like Arthur Andersen & Co. in Chicago from making big commitments to the

Continued on page 38

Excel

Price: $495

Requires:
- Intel 80286- or 80386-based PC
- 640K bytes RAM
- MS-DOS 3.0 or higher
- Windows 2.0 or higher
- Hard disk drive
- Graphics adapter card

Quickbasic: 'Mostly excellent but a little awful'

BY T. A. ELKINS
SPECIAL TO CW

I first learned of Microsoft Corp.'s Quickbasic 4.0 from a Microsoft public relations employee while it was being betatested. She said the program "breaks new ground. It is a wholly new technology."

And it just happens that this woman is both knowledgeable and honest. So I listened.

Quickbasic 4.0 does break new ground. The new technology is something very special, and almost everything good you hear about it is true.

But not everything done by Quickbasic is done well.

Quickbasic is really two systems, one of which is an interpreter. Interpreters are nice, and that was why, in large part, the original Basic became so popular. With an interpreter, it is possible to check a bit of logic, run a few lines of code and annihilate bugs on the fly.

And the interpreter is fast — very fast. In fact, it may reach more than half the speed of an .EXE file, which is remarkable.

Finally, Quickbasic formally adds a host of things to Basic that it has needed for a long time. With Quickbasic, procedures and long functions are a breeze. There is no need to ever write GOSUB ... RETURN again. Quickbasic uses math coprocessors, speeding calculation programs right along. It also has a nice long integer that is fast to process and offers a useful alternative to floating-point operations for users without math coprocessors.

Quickbasic's second feature is its editor. This programing advance does a sizable job of syntax checking as a program is written, checking every line of code entered. There is no danger of a program having a totally unacceptable line of code in a subroutine that never got executed until it was too late. It also hides the procedures and functions so that they only come up on the screen when they are needed.

The messenger

A real advance is Quickbasic's ability, when testing a program, to return to its editor at the point of a problem with often-useful error messages. This allows most of the features of the program to be altered and yet leaves the program restartable.

The editor's environment is also replete with little hints about the system's operation and has a fairly good Help system.

But all is not golden with Quickbasic 4.0. The program is still several times harder to use than it needs to be. It is needlessly complex, and it fails in the fundamental compiler design criteria of symmetry and uniformity. Quickbasic's documentation, albeit a major improvement on some past Microsoft efforts, still gives far too little information.

Using the Quickbasic system editor is not particularly hard, but in dozens of ways, it is not intuitive. As a result, the program takes both learning and relearning when taken up again after a hiatus. In addition, the editor is inconsistent, which is a major and continuing failure of design.

Consider the simple process of loading a program into Quickbasic. After several sessions, I would still use the Load feature on the files menu. Unfortunately, Quickbasic wants to see the Open selection made. I wondered for a good amount of time why I had to select my only program as the main module every time I loaded it.

There is nothing evil about this approach, but it must be learned and kept in mind each time it arises. When dozens of these editor oddities are added up, the result is a much heavier programmer load and much less reliability with the final result than could or should have been the case.

Quickbasic 4.0 is a large and powerful program with a great many features that make other software houses cringe with anguish and green with envy, but it follows the too believable Microsoft "standard" of mostly excellent except for a little awful. This from a company that has resources enough to do the job not just well but admirably.

Elkins is a computer and management consultant with academic interests in advanced public-key data encryption systems.

Pageperfect hits the shelves after 18 months

SAN RAFAEL, Calif. — Pageperfect, a software package combining word processing, desktop publishing and graphics, has started to ship after some 18 months on the vaporware list.

The program, created by International Microcomputer Software, Inc., reportedly allows users to switch back and forth from word processing to page composition with one keystroke while maintaining a document on the screen. The user will be able to see what changes are being made to a document, whether in the word processing or in a page-layout mode.

Graphics capabilities of the $495 program include a picture librarian, which stores pictures and allows them to be accessed while a document is on either screen. Pictures can be scanned directly into a document or into the picture librarian. Pageperfect comes bundled with Desktop Publisher's Graphics, which allows the user to change any dot on a picture.

Picture this

Using Pageperfect, a user can manipulate picture placement on the page at any time, and pictures can be added, deleted, moved, copied, resized or rescaled at any time, the company said. Using the same commands, the user can also move columns, rows, headers, footers, captions, margins and borders.

The program's word processor feature can be made to behave like Micropro International Corp.'s Wordstar or Ashton-Tate Corp.'s Multimate, the company said. A spelling corrector and Houghton Mifflin Co. thesaurus are also included.

Included in the product's desktop publishing capabilities are typographical and page-layout control, Bitstream, Inc. fonts, different point sizes, letter, word, line and paragraph spacing and positioning. The style of any letter, word or paragraph can be changed by the user, and additional fonts also can be added.

Excel

CONTINUED FROM PAGE 37

Microsoft spreadsheet. Citing Excel's relative ease of use, Andersen's Audit Division recently began swapping Excel with 4,000 copies of Lotus Development Corp.'s rival 1-2-3.

Andersen and others have been attracted by Excel's graphical user interface, which is said to mimic the interface of Microsoft's OS/2 Standard Edition 1.1 with the Presentation Manager.

Although Apple Computer, Inc.'s lawsuit against Microsoft has created some confusion about the future of Windows-based products and the Presentation Manager, Excel is still positioned as a tool that will bridge today's DOS world to the upcoming graphics-based operating system.

'Close enough'

"We're committed to a much more common user interface than what you get at the C prompt, and the Excel interface is close enough to Presentation Manager that it will make the future migration easier for users," said Jack Dreiss, director of development for Andersen's advanced computer audit techniques group.

Ironically, users seem to be attracted to Excel more because of its crisp graphics capabilities than its improved spreadsheet functionality. Although the program features an automatic macro recorder, minimal cell recalculations and built-in auditing tools, most users said they bought the product for its presentation capabilities.

"I was never satisfied with the quality of graphics from [1-2-3] — they were just ugly," said Vallerie Shelton, a technical assistant at McAdams, Roux & Associates, a Denver oil company. "With Excel files, I can dress up presentations that appeal to our investors."

However, Excel's inability to support multidimensional data bases has forced Shelton to store historical data of the firm's 60 oil wells on a hard disk in files from Borland International's Paradox data base.

A promise kept

Excel received high marks for making good on promises to bring the capabilities of Apple's Macintosh to DOS-based PCs. Many companies that have adopted a DOS- and OS/2-based strategy are reluctant to standardize on more than one machine, meaning that companies tend to stick with a PC standard and give up on advanced graphics.

"A lot of people love the Mac, but we decided to standardize on the PS/2. The challenge was to provide Mac functionality on an IBM PC, and Excel and Windows does that for us," Dean Witter's Egan said.

Dean Witter's financial services group is currently running 150 copies of Excel on IBM PS/2 Model 60s connected over an IBM Token-Ring local-area network with Novell, Inc. software. Taking advantage of the network, one manager can control master spreadsheets that are shared by many users with read-only access.

Excel, however, does have its problems when running over a network. Egan said the program has trouble interfacing smoothly with the group's network and that its spooling functions can be "clunky" when printing on the network.

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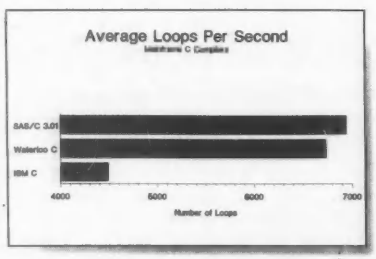

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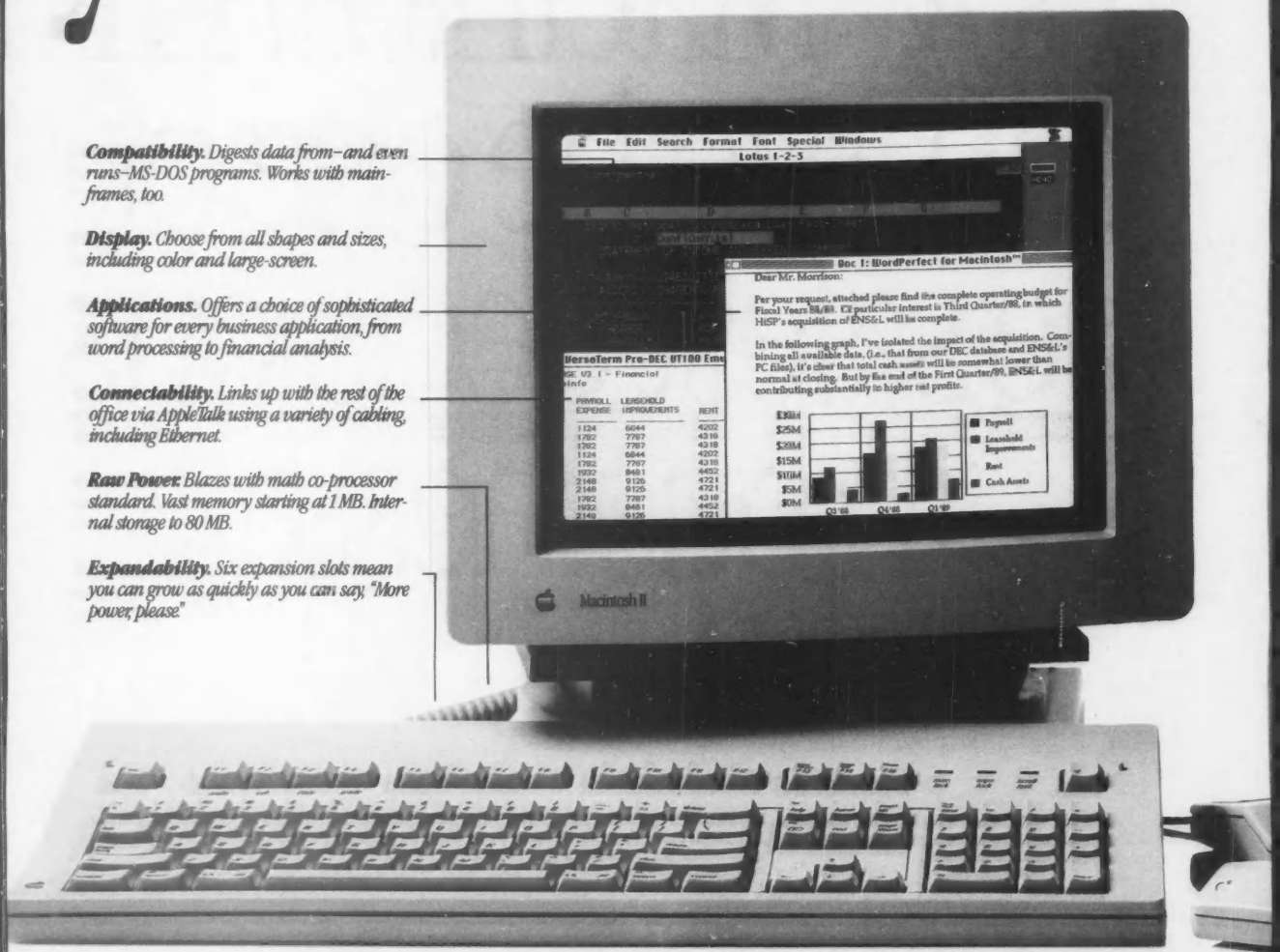

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Zachmann

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The PS/2 Models 30 and 25 are based on the Intel 8086 microprocessor and can't run OS/2 at all. Despite this major limitation, the Models 30 and 25 accounted for 62% of IBM's 1987 PS/2 shipments.

And despite IBM claims, nearly all the Intel 80286- and 80386-based AT bus-compatible systems from IBM's competitors will run OS/2 as well as or better than PS/2 Models 50, 60 and 80.

A Compaq Deskpro 386 Model 20 like the one I am using to write this column will handily outrun even the top-of-the-line IBM PS/2 Model 80 running OS/2 — and just about everything else, for that matter.

It is beginning to look like only about one out of every 20 PS/2s sold so far will really be able to run OS/2.

The problem is that though the PS/2 Models 50 and 60 based on a 10-MHz 286 microprocessor are able to run OS/2, they are not fast enough to deliver satisfactory performance. And once the graphical OS/2 Presentation Manager is added to OS/2 Standard Edition 1.1, the processing speed of a 10-MHz 286 will be sorely pressed and unable to provide adequate performance.

Still not enough

In fact, even the faster 12-MHz 286-based systems widely available from nearly every vendor but IBM aren't likely to be fast enough. OS/2 complete with Presentation Manager looks like it'll tax the capabilities of just about any 286-based system.

Ironically OS/2, designed for and thereby incorporating the limitations of the 16-bit 286 microprocessor, is not likely to provide satisfactory performance with anything less than the 32-bit 386 chip. Users expecting to be able to run OS/2 on their IBM PS/2 Models 50 or 60, as well as on 286-based AT compatible systems from other vendors, are likely to be disappointed.

Worse yet, for IBM, the inadequacy of 286-based systems in running OS/2 will be further aggravated by IBM's proprietary OS/2 Extended Edition. While OS/2 Standard Edition 1.1 will be slow enough to leave most users disgruntled on 286-based systems, OS/2 Extended Edition 1.1 will be even worse.

The PS/2 Model 50 simply won't be able to run OS/2 Extended Edition 1.1 at all. It hasn't got enough disk capacity or memory. The Model 60 will be able to run Extended Edition, but just barely. It will be roughly the equivalent of trying to run the original 1.0 version of Microsoft Windows on an IBM Personal Computer XT.

A major consequence of all this is likely to be the generation of a considerable backlash against IBM by those who bought PS/2s — other than the Model 80 — thinking that they were buying into the technology of the future.

Those who really want access to the new world of OS/2 software are going to find that they need a 386-based machine with lots of memory and a large hard disk. For the rest, OS/2 is likely to provide little beyond what is already available with MS-DOS and Windows. Until more powerful 386 machines are widely used, don't expect too much of OS/2 and OS/2 software.

Zachmann is vice-president of research at International Data Corp.

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NEC

Gassee

CONTINUED FROM PAGE 37

graphical-user interface. How will Apple maintain an edge?
I see the Mac evolving in power — and we'll obviously put more power into the existing framework. We can do that through what Motorola does with its processor line. We can do that with ASICs. We can do that through coprocessor cards. We will do that by developing the operating system over the months and years. Since we own the operating system, it will be easier for us to integrate all the parts together. We'll keep improving the user interface. Hypercard was a step forward for the user interface.

How do you see the battle for the desk top playing out?
I feel we have done something in networking of late that will play out in the market. We are reconciling two apparently different cultures. The host mainframe programming culture and the Macintosh personal computer culture are being reconciled through Mac APPC [Advanced Program-to-Program Communications], Macworkstation and other products we will introduce in the unspecified future.

The way we play the game of the multivendor environment will give us a competitive weapon. Examples are the Digital-Apple agreement, and the Apple provision of LU6.2 functionality with the Hypercard user interface on top of it. Macworkstation is another example where a Cobol programmer can control a Multifinder session from the mainframe — it allows a Mac user to do personal computing the way he or she is used to doing Cobol programming.

How much work remains to efficiently integrate the Mac into multivendor environments?
It's done.

What are the advantages of the Nubus architecture used in the Macintosh?
I think what Nubus does for developers, customers and systems managers is to provide them with a way to install additional functionality into the Macintosh without disturbing existing software; without dealing with DIP switches and stuff like that. You can bring networking functions, intelligent cards, display cards, printer controllers — what an open hardware architecture is supposed to do.

Can you identify the technologies that will be most important to Apple in the future?
There are a number of them. Systems software, ASICs, very high-speed networks, magneto-optical storage devices, high-density displays and color printing will all be important.

Describe the Apple of the 1990s.
Apple will be even more fun, because we will have very nice products, and products make us who we are — a place where individuals can have an effect on the business. We'll be an adult organization; adult as in both responsible and humble about our limitations, but not apologetic. We'll continue to be an example for some areas of the business, but not all areas. We'll continue to display a keener insight into why human beings like computers. That will keep us alive, financially and spiritually.

Antidote

CONTINUED FROM PAGE 35

ruses are alarming. "According to the National Bulletin Board Society, nearly 1% of all public-domain software is infected by one kind of virus or another," McAfee said. "The fact that many of the viruses are benign is not helpful. There are many that are not benign." Benign viruses are those that just print messages or scramble screens.

McAfee said viruses pose an especially high threat to corporate data bases and companies using networks. "The average user is aware that they exist," he said, but they do not realize that viruses are more threatening than bombs, which do things like destroy data on the hard disk but do not spread to other programs.

McAfee said most viruses are set to go off many months or sometimes years after they are planted. "Hackers do that to infect as many systems as possible. Once the virus has been activated, their fun is over."

Interpath's shield has reportedly been field-tested using more than 1,000 infected public-domain and commercial software packages.

C-4, which will retail for $29.95, resides permanently in the host PC system and monitors all host activity. It uses the Cylene-4 matching technique to identify characteristic viral signatures, and on detection, it freezes the viral activity and notifies the system user, McAfee explained.

Once caught by the program, the virus is unable to spread or multiply to infect other software in the system. After removal of the infected software, the system is returned to normal.

McAfee said if his product is put on a clean, virus-free system, it will prevent it from every becoming infected. However, "there is nothing to say that some hacker will not come out with a virus that we cannot detect. If a new technique is developed that can somehow circumvent our system, will will have to play catch-up again."

G-2 chip

CONTINUED FROM PAGE 35

ble with both the Intel Corp. 8088 for IBM Personal Computer XT clone development and the Intel 8086, for the PS/2 Model 30. The chip, said to be faster than the 8-MHz PS/2 Model 30, will be available in production volumes in May.

G-2 said it hopes to compete with the likes of Chips and Technologies, Inc. in selling PS/2 Model 30-compatible chips. A spokesman for G-2 said that although no large orders have been placed for the chip, the company has received inquiries from Taiwanese and Korean clone manufacturers.

IBM PC-compatible makers now have a greater number of chip vendors from which to choose.

The variety of vendors is not expected to make a great deal of difference to the end user, analysts said, unless the increased competition in the chip set market eventually forces some prices down. At this time, however, a price dip is unlikely because of the increasing costs of dynamic random-access memory chips.

With the current legal uncertainties surrounding the PS/2 Micro Channel models, G-2 said it plans to stick with the XT-bus Model 30 chip for now, according to Bill O'Meara, president. However, O'Meara said, G-2 will make a PS/2 Micro Channel-related announcement in June.

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Scannell

CONTINUED FROM PAGE 35

tween the two, the formal agreement signed by Gates and Sculley Nov. 22, 1985 is the basis for any settlement, whether made by the courts or worked out between the two companies.

Some observers say the battle between Microsoft and Apple over the interface is like two thieves fighting over a pot of gold. That pot of gold being Star, the operating environment developed at Xerox a couple of years before Jobs and Gates ever got together. Xerox, however, has given Apple the licensing rights to borrow technology for the Mac interface.

Why, besides some generalization about Microsoft violating "certain visual displays," is Apple suing? It's only second guessing, of course, but we suspect it wouldn't hurt Apple's chances in the corporate market if the firm could slow IBM's Intel 80386-OS/2-Presentation Manager juggernaut.

CHANCES ARE there is nothing in writing between Jobs and Gates.

It's hard to believe, however, that this suit will affect the delivery dates of something like the Presentation Manager, which borrows some traits from Microsoft's Windows 2.03. It may temporarily freeze the decision of some corporations that have decided to port their Microsoft MS-DOS applications to the Presentation Manager via Windows. But ultimately, the suit will be seen for what it is, a nuisance suit, and will be settled relatively amicably between the two parties out of court.

A new chip for the old block. Video Seven in New York today is set to introduce a graphics board that reportedly improves on IBM's Video Graphics Array, which is standard in its Personal System/2 line. A year after its introduction, it's good to see the PS/2 series finally getting some decent add-in boards.

Enter the laptop. A pretty good source has told us that Hitachi will make its debut in the U.S. market with a laptop system in either the second or third quarter. The company's decision to enter with a laptop and not a desktop system perhaps indicates its lack of confidence in making any kind of dent in that market.

Scannell is a *Computerworld* senior editor, microcomputing.

New Wave

CONTINUED FROM PAGE 35

cording to John Stankiewicz, project analyst in the Information Systems Division of Toronto-based Imperial Oil Ltd. "The switch to object-oriented code may not be as easy as some say, because there are differences."

New Wave uses object-management technology and artificial intelligence components to provide users with a single view of multiple applications on a network of computer resources. It is HP's method of tying systems together with an ease-of-use environment to rival IBM's Systems Application Architecture (SAA) and the Digital Equipment Corp. architecture.

New Wave's user interface is built on Microsoft's Windows and the OS/2 Presentation Manager. But writing a program or application for Windows is not necessarily the same as writing for the Presentation Manager, Stankiewicz said. As a result, he said his company is uncertain which path to take.

"If you develop for Windows, the programming is more cooperative-oriented, whereas Presentation Manager is preemptive," Stankiewicz said.

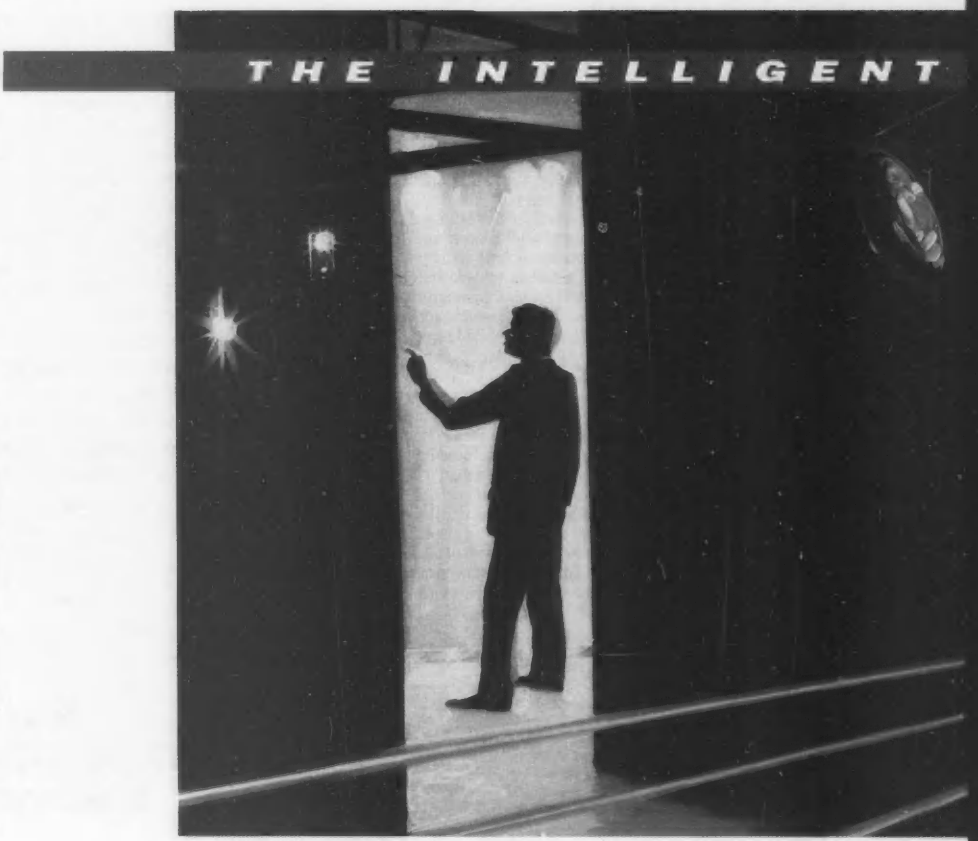
"OS/2 Presentation Manager is similar to Windows," said Russell Warner, Microsoft director of systems marketing. "Windows is the strongest base to begin developing OS/2 applications."

Other conference attendees said New Wave needs a full-fledged word processing application supporting it in order to build the kind of "compound documents" — voice, graphics, text and eventually video — that New Wave could deliver.

At this time, New Wave supports only encapsulated word processing that does not offer the full functionality of an application. Some attendees speculated that Wordperfect Corp. would be the likely candidate.

Wordperfect officials were not present at the conference, but a spokesman for the firm confirmed that it is looking into New Wave but has no definite plans for porting its software to that environment.

Pete Peterson, Wordperfect's executive vice-president, said his firm is interested in New Wave but is "concerned about all these different environments."



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NEW PRODUCTS

Software applications packages

Time/X, a time scheduler for use on IBM Personal Computers and Personal System/2s, has been announced by **Oak Park Software, Inc.**

Time/X is said to automate reminder notes, to-do lists, appointment books, calendars and tickler files. It allows unlimited access to past as well as future schedules and maintains a history of scheduled activities.

Other features include automatic pop-up reminders; a built-in word processor; identification of scheduling conflicts; generation of printed schedules; import and export capabilities; and password protection.

Time/X costs $82.

Oak Park Software, P.O. Box 710, Milwaukee, Wis. 53201. 414-797-7911.

Process Integrity, Inc. has added a Cost of Quality module to its **Quality Management Data System.**

The new module incorporates a host algorithm that allows a user to measure activities in dollars, the vendor said. Inquiry by reporting unit and individual cost element is done in real-time.

The software system runs on IBM Personal Computers and compatibles as well as on IBM's Personal System/2.

The Cost of Quality Module can run stand-alone or as an integral part of the Quality Management Data System. It is available for $495 in a single-user version, $2,495 for a small network and $6,995 for a large network.

Process Integrity, #340, 2301 E. Lamar, Arlington, Texas 76006. 817-633-4765.

A project planning and management tool called **Topdown Project Planner** has been announced by **Ajida Technologies, Inc.**

According to the vendor, Topdown allows users to merge graphics outlines into a work breakdown structure. Projects are composed of hierarchically arranged tasks. High-level conceptual tasks are progressively divided into smaller and smaller subtasks. At each level, resources, expenses and precedence relationships may be assigned and summary reports generated.

Features include graphics generation; individual resource calendars; filtering and sorting; Gantt charts, Pert networks, resource histograms and cost graphs; and on-line Help.

Topdown is available for IBM Personal Computers and Personal System/2s. It costs $495.

Ajida Technologies, 613 Fourth St., Santa Rosa, Calif. 95404. 707-545-7777.

A software test case generator called **T** has been introduced by **Programming Environments, Inc.**

The software is said to allow developers to construct testable requirements with the help of input screens. T uses the requirements to automatically produce test cases that exercise every requirement for 100% function coverage and every most probable error (MPE) for 100% MPE coverage.

T works on IBM Personal Computer ATs under IBM PC-DOS. It requires 640K bytes of main memory, 10M bytes of hard disk and 1.2M bytes of floppy disk memory. Test case input files may be transmitted via a Hayes Microcomputer Products, Inc.-compatible modem from the PC to a host computer.

T is priced at $6,500, including training.

Programming Environments, 4043 State Highway 33, Tinton Falls, N.J. 07753. 201-918-0110.

A document processing and executive management package has been announced by **Lanier Business Systems Division**, part of Harris Corp.

Deskworks is an integrated office application offering word processing and document creation capabilities. Features include forms generation; automatic outlining; windowing; Greek, scientific, statistical and math capabilities; floating footnotes, headers and footers; page numbering; global search and replace; list merge; and the ability to exchange files with other applications, including Samna Corp.'s Samna, Micropro International Corp.'s Wordstar, IBM's Displaywrite III and Wordperfect Corp.'s Wordperfect 4.1.

Also included are a telephone directory with automatic dialer, a scheduler, a 92,000-word spelling checker and a thesaurus.

Deskworks, priced from $395, runs on IBM Personal Computers and Lanier's personal computers and workstations.

Lanier, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324. 404-329-8000.

An Apple Computer, Inc. Macintosh version of the **Labtech Notebook** data acquisition software package has been announced by **Laboratory Technologies Corp.**

The software is said to set up a Macintosh with multiple channels that gather data samples from and send control information to attached instruments and other devices used in laboratory and process-control applications.

Labtech Notebook operates on Macintosh computers equipped with a compati-

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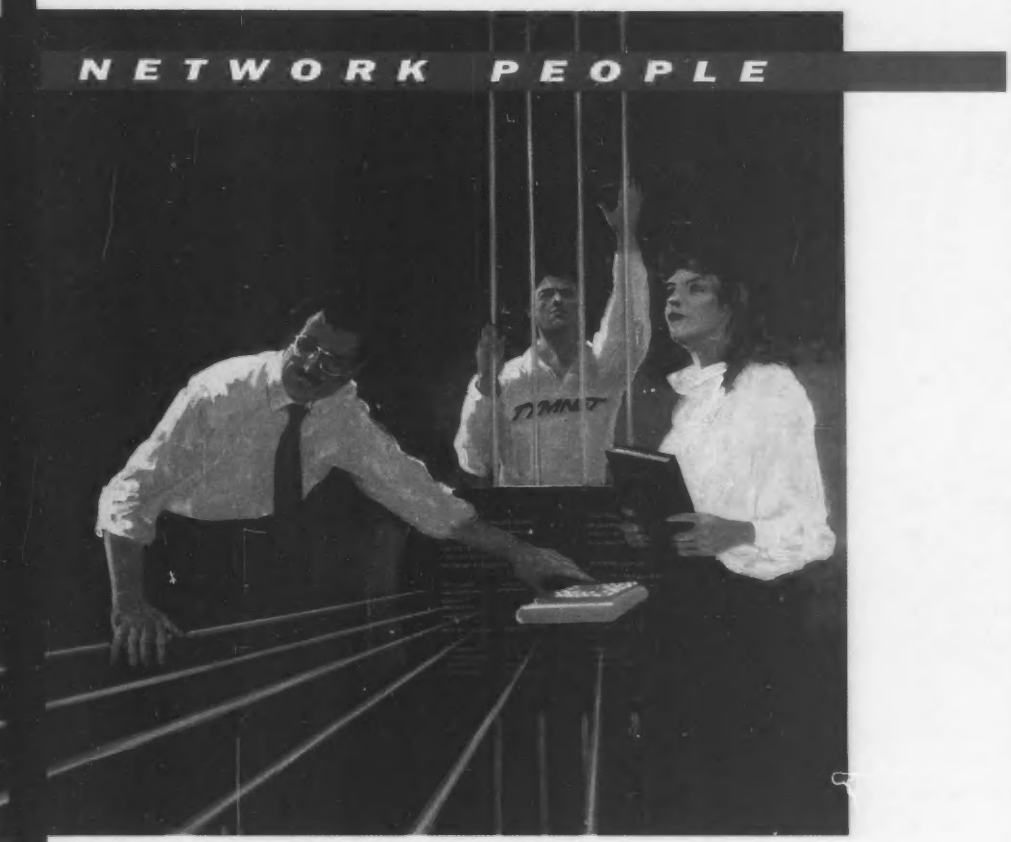

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Continued from preceding page
ble data acquisition interface board and data acquisition systems connected to the Macintosh via an RS-422 port.

Functions include user-definable control and display setups and parameters; real-time mathematical, statistical and signal processing calculations; data replay; and continuous data collection.

The Labtech Notebook costs $995.

Laboratory Technologies, 400 Research Drive, Wilmington, Mass. 01887. 617-657-5400.

An automated testing system has been announced by **Software Recording Corp.**

Autotester allows users to create test tapes that can run unattended while simultaneously documenting the process and providing analytical information, the vendor said.

A library of test tapes is created for exercising each feature. A feature can be retested an infinite number of times in an infinite number of combinations.

The testing sessions are said to subject systems to regressions testing in order to confirm that isolated changes do not impact unexpected areas.

Autotester runs on a personal computer concurrently with other applications or with terminal emulation or communications software. A single-CPU license costs $3,000.

Software Recording, Suite 122, 6060 N. Central Expwy., Dallas, Texas 75206. 214-368-1196.

The Personnel Director, a data base system designed for tracking personnel, has been announced by **Jeja Software.**

The Personnel Director runs on IBM Personal Computers and Personal System/2s. It maintains statistics on all employees, the vendor said. Features include a built-in word processor and a menu-driven user interface with context-sensitive Help screens.

The Personnel Director costs $199.95.

Jeja Software, P.O. Box 1834, Herndon, Va. 22070. 703-689-3259.

A data graphing package that transforms ASCII, DIF and SYLK data into two- and three-dimensional graphs has been announced by **The Small Computer Co.**

FPgraph transforms data from the vendor's Filepro 16 and Filepro 16-Plus data base management systems under Microsoft Corp.'s MS-DOS. Features include more than 400 colors from a palette of 16, a five-key user interface, Help screens and 976 preset graph type and viewing angle combinations.

Users can also pan, zoom, stretch, shrink and change the perspective of a graph.

FPgraph requires an enhanced graphics adapter, a color graphics adapter or a Hercules Computer Technology, Inc. monochrome adapter. It costs $250.

The Small Computer Co., 41 Saw Mill River Road, Hawthorne, N.Y. 10532. 914-769-3160.

An employee management system for personnel administration has been announced by **Softland International, Inc.**

Called the **Personnel Manager Plus**, the software is capable of handling up to 500 employees. It allows storing, retrieval, modification and reporting of personnel data such as background information, wage reviews, warnings and commendations, classes taken, absences, workmen's compensation claims and vehicle accidents.

Personnel Manager Plus runs on IBM Personal Computers under IBM's PC-DOS or Microsoft Corp.'s MS-DOS 3.1 or higher. It costs $199.95.

Softland International, Suite A, 320 Harris Ave., Sacramento, Calif. 95838. 916-921-6403.

A personal computer-based project management system has been announced by **Poc-It Management Services, Inc.**

The program, called **Microman II**, is said to plan, schedule, monitor and report on tasks as well as supply management summaries.

Users can compare actual to planned project performance; schedule projects individually or concurrently; display planned resource assignments and track resource utilization; track service requests and project work load backlog; and produce custom reports.

Features include windowing, context-sensitive Help, multilevel security, support for local-area networks and the ability to interface with other application programs, such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase products.

Microman II costs $2,895.

Poc-It, Suite 512, 606 Wilshire Blvd., Santa Monica, Calif. 90401. 213-393-4552.

Digital Communications Associates, Inc. has announced that its **Irma 3279 Graphics** software now supports IBM's Personal System/2 Micro Channel architecture-based computers.

The Micro Channel version of Irma 3279 Graphics allows a PS/2 Model 50, 60 or 80 to emulate an IBM 3279 S3G color terminal, thus enabling the user to create mainframe color graphics in any IBM 3270 processing environment. Users can display graphics created from the mainframe and store them on disk in order to redisplay or print on a PC printer or plotter at a later time.

The version of Irma 3279 Graphics costs $1,995.

Digital Communications, 1000 Alderman Drive, Alpharetta, Ga. 30201. 404-442-4000.

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DATA STREAM

Elisabeth Horwitt

Voice/data: the real thing

It's happened before, it'll happen again: Vendors start hyping some brand new way to do networking long before they have real products and applications that will do their customers some good. By the time they really have something worth looking at, users are so tired of hearing the hype that they ignore the good stuff when it arrives — to everyone's loss.

This could be happening now with voice/data integration. And that would be a real shame.

Vendors like Wang-Intecom, Northern Telecom and IBM's Rolm subsidiary have been glorifying voice/data integration on the digital private branch exchange (PBX) for years now. But they haven't come up with the applications or products capable of weaning computer users away from their local-area networks and data PBXs. Rolm now offers primitive integration of voice and electronic mail on PBXs and hosts and some low-level alerts traveling from Rolm switches to IBM's Netview. Industry scuttlebutt has it that true synthesis with IBM hosts will come with the next generation of Rolm central branch exchanges.

But what do users really want? A recent survey by Market Information Center, Inc. showed data makes up only 8% of digital PBX traffic today; that

Continued on page 46

The joy of Mac-to-IBM links

'Adventurous souls' overcome host-access hurdle at shipping firm

BY JULIE PITTA
CW STAFF

OAKLAND, Calif. — When Apple Computer, Inc.'s Macintoshes began to show strong signs of overtaking IBM Personal Computers as the corporate workstation of choice at American President Companies, Ltd. (APC), the company acquiesced to user preference. But having done so, the $1.9 billion shipping firm found itself confronted with a serious problem: how to provide Mac devotees with the same level of host access enjoyed by PC users.

APC keeps its IBM mainframes in two computer centers located in San Mateo, Calif., and Hong Kong. Personal computer users at various APC sites routinely access data center mainframes through their micros for information pertaining to all areas of shipping, including cargo destinations, how cargo is stored, the type of vehicle it is stored in and the type of cargo.

Until recently, those PCs were strictly IBM. Today, users are requesting Macintoshes 9-to-1 over Microsoft Corp. MS-DOS-based machines, according to Michael Cromar, APC information resources director.

Quiet Mac attack

Macintoshes began sneaking in the door at APC in late 1986, despite some resistance from APC's information systems hierarchy. Unlike some organizations, APC said it allows its users to have significant influence over the type of systems they use. Today, there are 250 Macintoshes at APC, all connected to the firm's IBM mainframes. But MS-DOS-based machines still hold a commanding lead — APC has about 2,000.

"It took a few adventurous souls to bring the Mac in and demonstrate its usability," Cromar said. "One of the things that broke barriers was that some of the early Mac users were senior managers in the information resource department."

Much of APC's initial reluctance to deviate from IBM on the desk top was tied to the fear that Macintoshes could not easily be

Continued on page 55

LAN vendors explore distribution options

Following in the footsteps of personal computer vendors, local-area network suppliers are expanding their distribution options, according to consulting firm Infonetics, Inc.

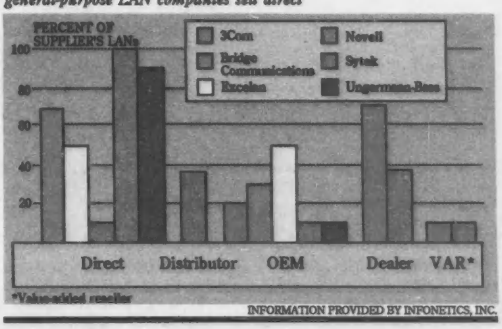
Companies that manufacture general-purpose LANs connecting a wide variety of systems — such as Bridge Communications, Inc. and Ungermann-Bass, Inc. — tend to sell both directly and, to a lesser extent, through OEMs, the Santa Clara, Calif., consulting firm said in a recent report (see chart at left).

In contrast, PC LAN vendors such as Novell, Inc. and 3Com Corp. tend to sell through third parties, including dealers and value-added resellers. VARs are increasingly selling PCs into specialized vertical markets, creating an aftermarket for LANs, Infonetics noted. Novell also sells through distributors.

However, dealers are less likely to have the personnel required to sell, support and install LANs effectively. Novell, 3Com and IBM are cutting down on the number of dealers authorized to sell their networking equipment, both to weed out poor performers and to cut down on price competition.

LAN distribution channels, 1987

Personal computer LAN vendors favor dealer outlets, but general-purpose LAN companies sell direct



INFORMATION PROVIDED BY INFONETICS, INC.

Timeplex enhances T1 switch

BY ELISABETH HORWITT
CW STAFF

WOODCLIFF LAKE, N.J. — Timeplex, Inc. introduced several enhancements last week said to provide more effective management and utilization of bandwidth on its Link/2 Data/Voice Network Exchange T1 switch. Also unveiled was a data option for the Link Packetized Voice Subsystem (LPVS).

A new framing algorithm incorporated into Link/2 is said to ensure that "all bandwidth on the trunk will be used for transporting meaningful information," with some overhead allowed for synchronization and supervisory control, Timeplex said.

The new algorithm can allocate more bandwidth to the supervisory communications channel — resulting in faster supervisory responses for remote nodes — while also supporting an enhanced alternate routing feature that automatically switches data over to a backup channel when the primary channel goes down. It is scheduled to ship in May. Existing Link/2 systems can be upgraded, Timeplex said.

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Inside

- NSA communications line supports Hayes modem features. Page 50.
- Orion to support OS/2 LAN Manager under SNA. Page 50.
- DEC adds interface for Microvax 2000. Page 60.

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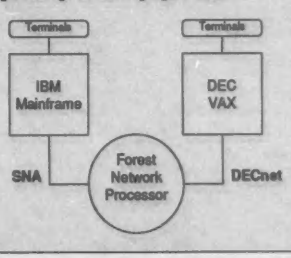

For a Forest Network Processor product information kit, please call (517) 349-4700.

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NSA tools support Autosync

Network Software Associates, Inc. recently said that its entire AdaptSNA line of communications software now supports **Hayes Microcomputer Products, Inc.'s** Autosync features in 2,400 and 9.6K bit/sec. modems. Autosync reportedly automates the execution of asynchronous-to-synchronous data conversion.

This turnkey combination reportedly enables an IBM Personal Computer or compatible equipped with a Hayes modem to serve as a remote IBM 3270 workstation for synchronous access to an IBM mainframe.

Touch Communications, Inc. in Scotts Valley, Calif., is working with **Motorola Computer Systems** to port the Touch Open Systems Interconnect (OSI) family of networking products to AT&T's Unix System V, Release 3. The ported products will run on Motorola's Unix-based System 8000 family.

Touch also said its OSI software will now run on **Kinetics, Inc.'s** Etherport II board, which runs in an Apple Computer, Inc. Macintosh II.

Network software developer **TOPS,** a Sun Microsystems, Inc. company, has announced it will market **Kinetics'** line of hardware products. The $800,000 agreement enables TOPS to include Kinetics networking hardware and software as part of its TOPS for Sun workstations in order to provide customers with a Macintosh-to-Unix internetwork package.

In addition, TOPS is licensing Kinetics' K-Talk, an implementation of Appletalk networking protocols for Unix 4.2 and 4.3 implementations, including Sun's SunOS 3.X.

Virtual Microsystems, Inc. and **Ungermann-Bass, Inc.** have inked a joint OEM agreement under which Virtual will license its Network Co-Processor technology to Ungermann-Bass for incorporation into the company's next-generation Digital Equipment Corp. VAX product line. The Network Co-Processor is an internetwork operating system for integrating VAXs into heterogeneous local-area networks.

TRW Information Networks has signed a $5 million technology license agreement with **Crosscomm Corp.** to manufacture and supply Crosscomm-designed products worldwide. TRW will build a LAN bridge and bridge software compatible with its Transmission Control Protocol/Internet Protocol ACU 2000 product line.

TRW also announced a $500,000 networking agreement with Monsanto Chemical Co.'s Decatur, Ala., Plant and Technical Center.

TRW will install a dual-cable broadband network linking more than 30 buildings, an array of VAXs and DEC PDP-11s and more than 150 personal computers in the industrial complex.

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Orion to support LAN Manager

BY PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — Orion Network Systems, Inc. is set to announce support for Microsoft Corp.'s OS/2 LAN Manager under its version of IBM's Systems Network Architecture (SNA) software today.

The move will let users of large SNA networks integrate OS/2-based local-area networks into IBM backbone networks.

The announcement precedes a demonstration at the Microsoft Advanced Network Development Conference here. Orion will demonstrate its SNA62 Facility, which includes support for PU2.1 and LU6.2, as well as its SNA0123 Facility. Both programs will be implemented using a pair of Intel Corp. 80286-based micros equipped with adapter cards from 3Com Corp. and AST Research, Inc., running OS/2 with the LAN Manager.

Orion's approach to bringing SNA connectivity to IBM Personal System/2 LANs involves putting an Advanced Program-to-Program Communications (APPC) interface on top of Named Pipes, an applications programming interface under LAN Manager. APPC provides peer links into mainframes using IBM's LU6.2 SNA protocol.

Orion's client/server-based approach provides SNA support within the LAN environment by enabling users to access resources off the network. "Any personal computer on the LAN can access non-LAN resources via the communications software on the server," Orion claimed.

This server-based approach also conserves memory and processing requirements by necessitating that only a thin layer of interface code reside on each PC. The full set of communications software is located on the server.

Orion contrasted its approach, which uses a gateway implementation, with IBM's approach as implemented in the Communication Manager feature of OS/2 Extended Edition. Orion claimed IBM will require each PC on the LAN to run its full set of communications.

Orion's software also supports Apple Computer, Inc.'s Macintosh operating system and Unix.

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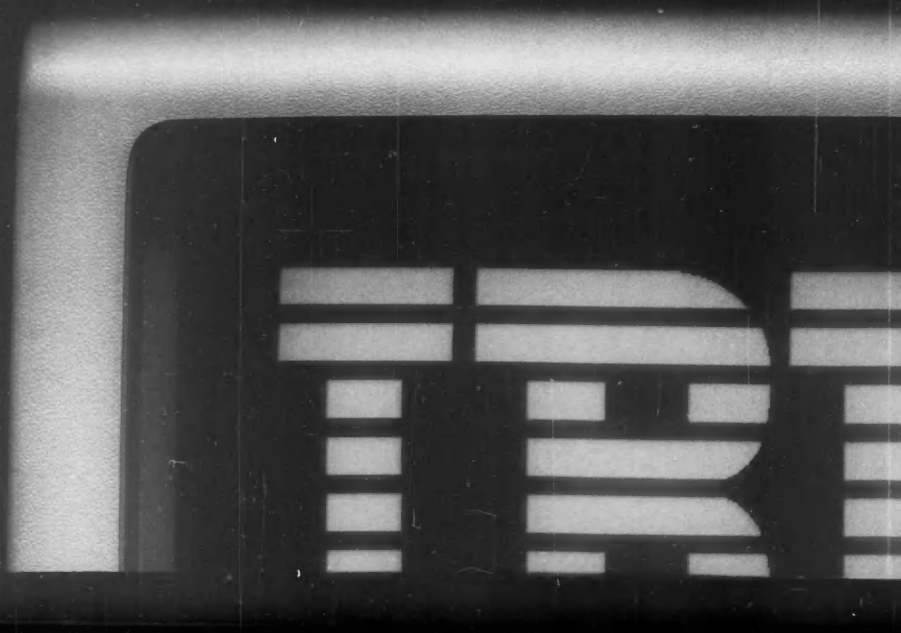

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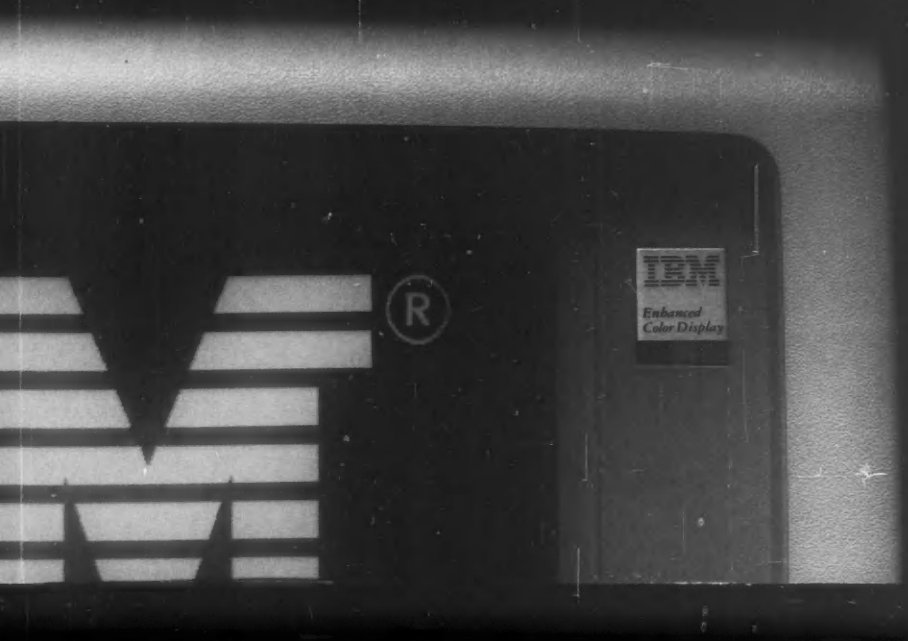

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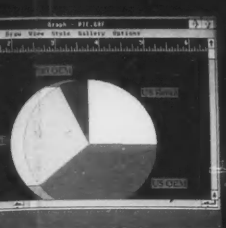

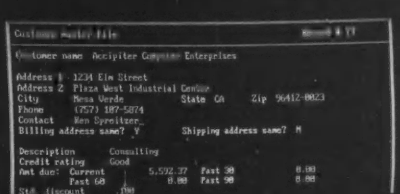
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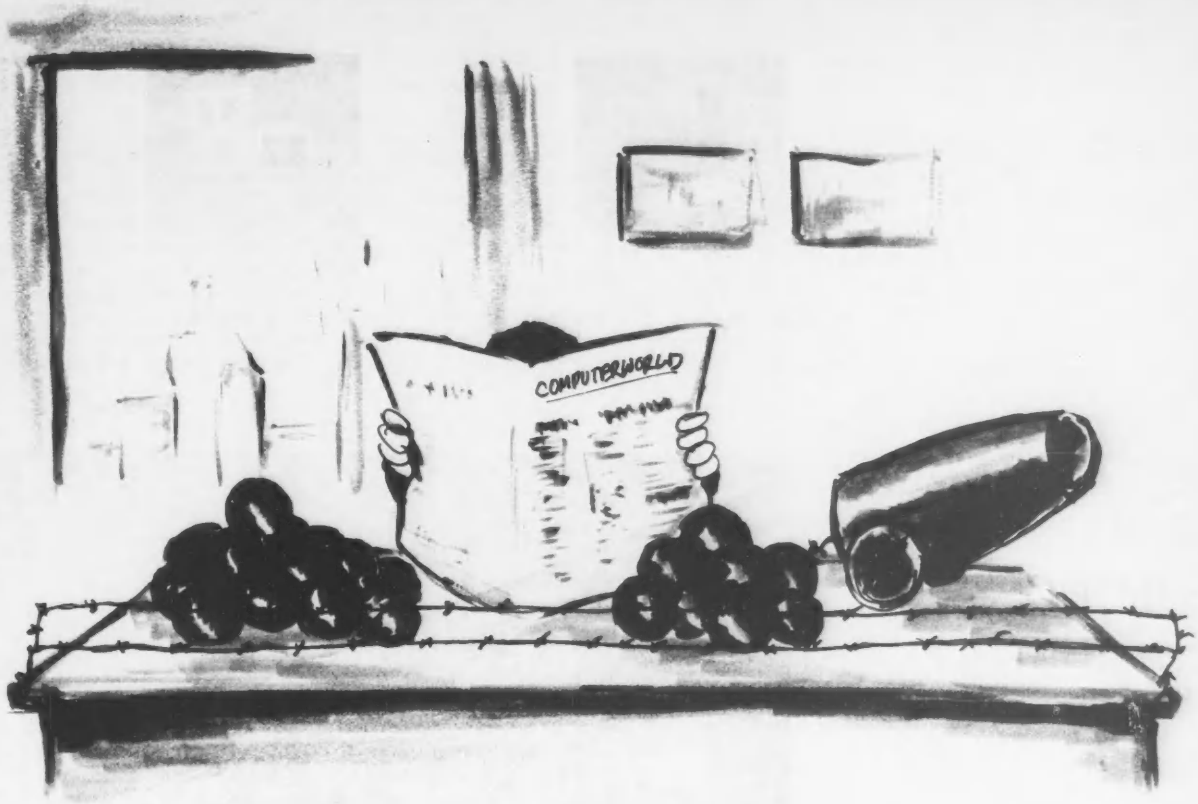

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MICOM'S BLUEPRINT SOLUTIONS LET YOU BUILD A SOPHISTICATED VOICE/DATA NETWORK THAT'S AFFORDABLE.

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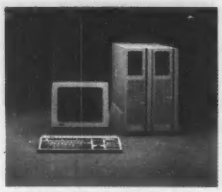
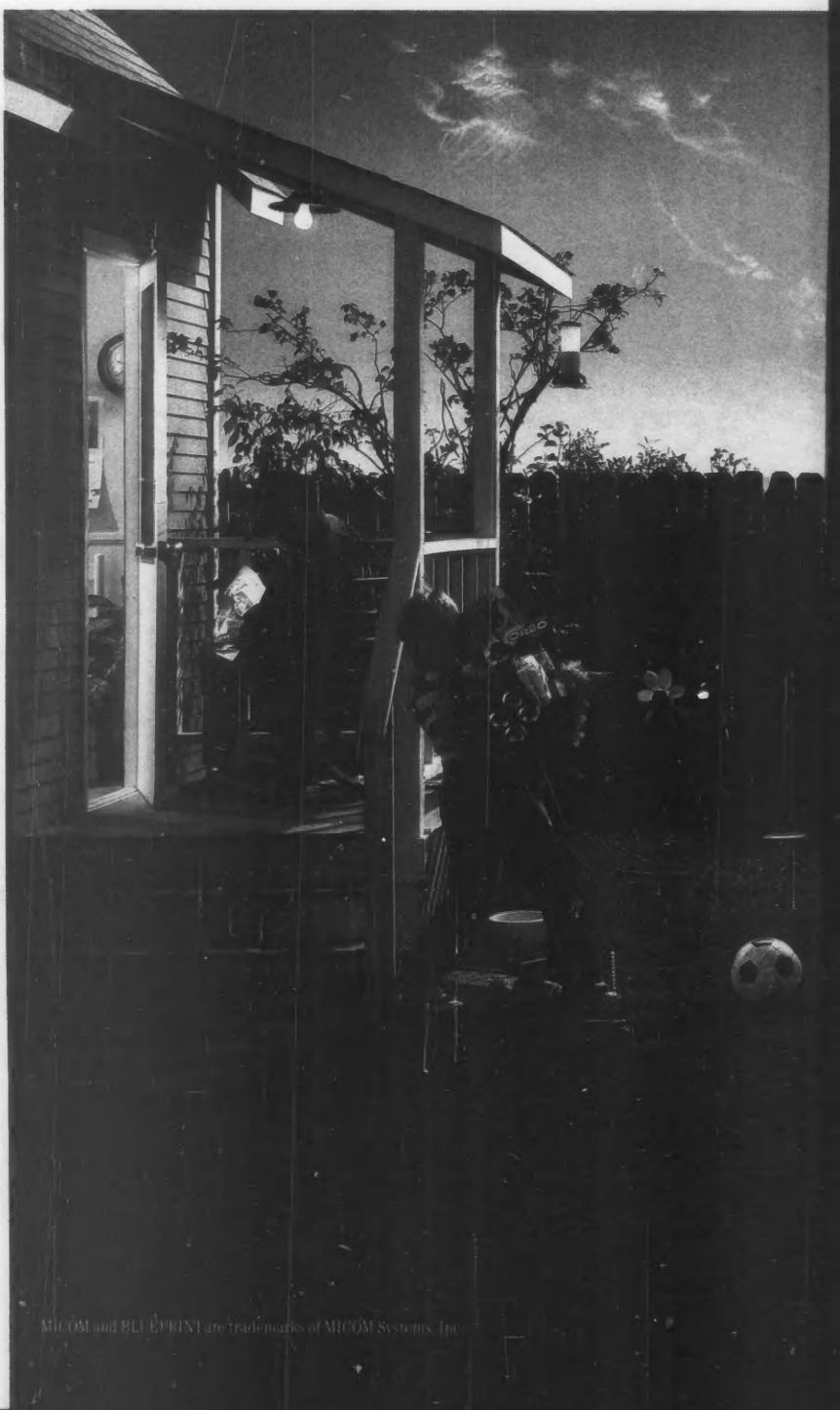


availability. And, its powerful, easy-to-use management facilities give you complete control of your network.

Our digital resource manager works with an extensive range of applications and services—from T1 and 2 Mbps or 56 Kbps and 64 Kbps digital services to private network alternatives. It's compatible, too, with existing public network standards, and is designed to accommodate emerging standards, such as ISDN.

Capitalizing on the advantages of X.25,



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MICOM

Integrated Technology for Network Builders

Horwitt

FROM PAGE 47

figure is seen increasing to 20% during the next two years. And Northern Telecom's attempts to sell a combination PBX switch and office automation node have failed abysmally.

True, T1 switches have been handling a lot of data recently, as firms seek to link remote sites to data centers and to save money through voice/data integration. This trend has clearly provided some of the impetus behind IBM's alliance with Network Equipment Technologies, Unisys's purchase of Timeplex and Hewlett-Packard's rumored search for a T1 partner.

But these vendors also seem to be trying for application-oriented voice/data integration that would go far beyond using a PBX or T1 multiplexer to feed data into the computer.

"People ask, 'What is the next magic application for tying PBXs, computers and networks together?' " says Bart Stuck, a vice-president at Probe Research. Stuck's answer: Anything that requires an agent to call up data on the screen while talking over the phone. For example, a PBX or switch could route a prospective customer's call to a disengaged telemarketing representative or service agent, at the same time sending the customer's file to the agent's screen.

A switch-computer hybrid could greatly improve agents' responsiveness to customers, by feeding them call-related information, prioritizing incoming calls and, if all representatives are busy at one office, routing calls to another site.

Busy market

DEC seeks to address the above markets with its Computer Integrated Telephony program, a series of alliances with PBX vendors aimed at developing voice/data applications through links between an intelligent PBX switch and a VAX. Data General is attacking the market from another angle through its agreement with Japanese PTT Nippon Telegraph and Telephone to co-develop an intelligent network switch that combines circuit and packet switching with the computing power of a DG host.

Both IBM and DEC are marketing their computers as data base engines and application processors that would work closely with local carriers' central office switches. This would make it far easier for the telephone companies to provide the types of applications discussed above as services. Now that District Judge Harold Greene has further expanded their boundaries, the regional Bell holding companies should be entering this market rapidly.

At the very least, computer-telecom integration will provide more efficient ways to distribute data and applications within their organizations and to customers and business partners. The far more imaginative ways to exploit computer-telecom integration are already being explored in-house by financial services, airlines, insurance companies and other deregulated, highly competitive sectors in which customer service and rapid deployment of data are competitive weapons. For example, Chase Manhattan Bank is working on a natural-language application that automatically validates funds-transfer telexes and eventually will reformat the information and route it to the right department's computer.

What computer vendors and their telecom allies offer is a cost-effective way for other companies — not bleeding-edge innovators, but the smaller, more cautious firms — to sample the possible benefits of intelligent networking applications without making too big an investment in software development, or even hardware if they go with a Bell company's service. The real question is whether companies will be willing to make drastic changes to the way they do business. And their decisions will determine more than the fate of a few vendors; they could have long-term implications for their ability compete in the future.

Horwitt is a *Computerworld* senior editor, networking.

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Links

CONTINUED FROM PAGE 47

hooked into the firm's worldwide IBM Systems Network Architecture network, he explained. Before the introduction of the Mac SE and the Mac II last spring, Apple's networking capabilities were limited, Cromar added.

To link the two worlds, APC has settled on a mix of Apple and third-party products. Within Appletalk networks, APC has implemented Tridata Corp.'s Netway protocol conversion box bundled with Tridata communications software. Sixteen Macintoshes can be connected to one Tridata box using Farrallon Computing's Phonenet, which allows Appletalk cables to connect to standard twisted-pair cables.

Tending to speed needs

For users who require faster processing speeds, APC has equipped Macintoshes with Digital Communications Associates, Inc. Irma 3270 terminal emulation boards. Despite its lower connection speeds, APC will continue to use Tridata's box because it costs approximately $200 per Mac connection, while Irma boards cost slightly less than $1,000 per connection, Cromar said.

"The first difficulties in hooking the Macs to the mainframe involved the very different user interface of Mac software and mainframe software," Cromar maintained. "For example, when people accessed E-mail, they expected the same ease-of-use in those sessions as when they use the Mac."

To solve this problem, APC licensed Macworkstation, Apple's software product that allows a Macintosh to retain its user interface when connected to a host computer.

Connecting Macintoshes to IBM mainframes allows APC users to call up information from the mainframe, download it and then "cut it out and paste it into" Mac applications, which provides superior graphics capabilities compared with PC packages, Cromar said. Currently, APC is working on an application that allows the Mac to access data regarding cargo storage from the mainframe and then organize that information graphically so loads can be stored more efficiently.

Timeplex

CONTINUED FROM PAGE 47

Another Link/2 enhancement, biased routing, is said to allow users to predefine how transmission load can be balanced among several T1 channels and to configure network traffic to avoid certain routes.

Timeplex also announced an internodal partitioning feature that allows users to provide local control of network segments on a node or data link basis while leaving some nodes to be centrally managed through the Link Network Management System.

In addition, Timeplex's LPVS, which is said to provide a 10-to-1 voice compression ratio, has been enhanced to support data on a separate channel.

The LPVS-6/1 accepts a single 9.6K bit/sec. data channel and six voice channels. The LPVS-4/1 accepts one 19.2K bit/sec. data channel and four voice channels.

NSA claims SAA features for AdaptSNA

BY PATRICIA KEEFE
CW STAFF

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) has introduced Version 4.0 of its AdaptSNA personal computer-to-host communications software family.

According to NSA, AdaptSNA is the first communications software product that implements the principles of Systems Application Architecture, IBM's device-independent global connectivity strategy.

Available for immediate delivery, the new products run on IBM Personal Computers, PC XTs, ATs, laptops and compatibles, implementing a full range of IBM Systems Network Architecture. The protocols supported include IBM's 3270, LU6.2/Advanced Program-to-Program Communications (APPC), 3770/RJE and LU0.

In addition, NSA reported that each AdaptSNA package is now link-independent.

This means that the same software — including all user interfaces — can now be used over any physical link, including a remote Synchronous Data Link Control line using a variety of integrated or external synchronous modems, a coaxial link via a remote or channel-attached IBM 3274/3174 controller or even an asynchronous link, according to NSA.

This is particularly important because it provides PC users with a cost-effective migration path, allowing them to change physical transmission links without sacrificing investments in applications interfaces or operator procedures and training, NSA added.

Prices for modules under Version 4.0 remain unchanged. The 3270 costs $585, APPC is $285, RJE costs $785, and LU0 is $585.

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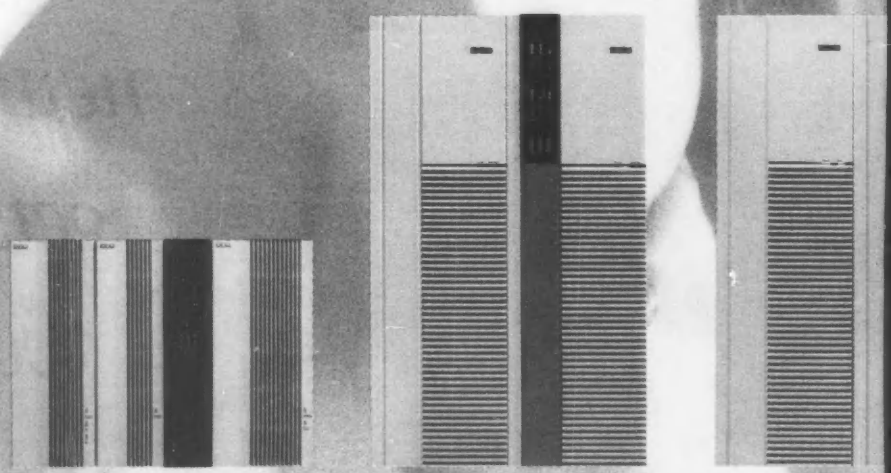

The NCR System 10000. A new family of mid-range computers designed to provide uncompromised productivity for both data processing and business professionals.

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NCR's System 10000 combines the flexibility and ease-of-use of PC-based workstations with the power of a host processing system. The System 10000's virtually seamless interface allows users to open up to nine windows, executing both host and PC processes on a single PC workstation. And NCR's ITX Information Bridge (IIB) enhances PC networking, giving users transparent access to ITX files and PC-shared files in the ITX system—along with electronic mail and filing capabilities.

TRANSPARENT NETWORKING

The NCR System 10000's ITXNET is designed to provide the DP professional with powerful networking and distributed processing capabilities—all without additional programming or changes to current applications.

ITXNET provides complete end-to-end network management to optimize resources and balance workloads better than ever before. And, it's completely transparent to the business professional.

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Where connections to a multi-vendor network are required—peer-to-peer or subordinate-to-host—NCR's System 10000 provides SNA and OSI protocols including PU-T2, PU-T2.1, X.25, X.29, and X.400.

R System 10000.
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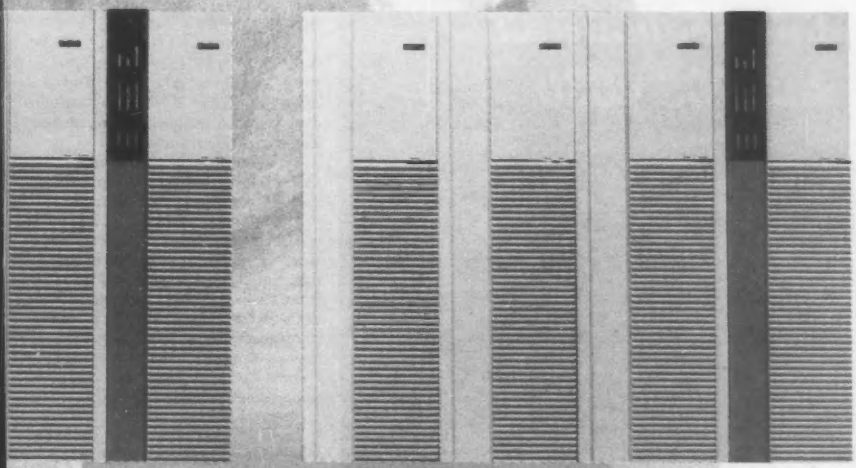

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Advanced development tools like CorVision,™ a fourth generation language incorporating CASE techniques, and ORACLE,® a relational database with SQL, have been integrated into the System 10000 to help reduce application development time.

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The System 10000 combines open systems architecture with the enhanced performance of NCR's 32-bit processor technology and ITX operating system. Four models provide the flexibility to meet your requirements—from a basic system to a clustered configuration with connectivity for up to 4,000 workstations.

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To provide maximum system availability, NCR's System 10000 is available with our Expert System for Preventive maintenance (ESPm)... including artificial intelligence, remote maintenance and unattended analysis. Plus, NCR's service and support teams are available for over-the-phone diagnosis or an on-site call.

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NEW PRODUCTS

Local-area network software

Asynchronous communications service software for use in networks running Corvus's PC/NOS network operating system has been announced by **Corvus Systems, Inc.**

Called **Nostalk**, the software allows modems located anywhere on the network to be accessed by any user on the network. It is Hayes Microcomputer Products, Inc.-compatible and features a script language with a learn mode. It also includes communications server software as well as user communications software.

Support is provided for the Hayes AT command set, modem speeds from 300 to 19.2K bit/sec. and Digital Equipment Corp. VT100 terminal emulation.

The Nostalk asynchronous communications service for PC/NOS networks costs $495.

Corvus, 160 Great Oaks Blvd., San Jose, Calif. 95119. 408-281-4100.

Customer-premise equipment

A data service unit that allows user data terminal equipment to access Dataphone Digital Service with Secondary Channel has been introduced by **Racal-Milgo.**

The **Communications Management Series** (CMS) **DSU 1556** provides data throughput of 56K bit/sec. point to point for such applications as file transfers and computer-to-computer communications. It accepts network timing from external master clock supply sources and can operate as a limited-distance point-to-point modem at synchronous data rates of 19.2K, 38.4K or 56K bit/sec. over private networks.

The CMS DSU 1556 can be used to test, monitor, configure and report alarms to central or remote sites.

The unit costs $1,695.

Racal-Milgo, 1601 N. Harrison Pkwy., Sunrise, Fla. 33323. 305-475-1601.

An automated voice-response telephone system that uses artificial intelligence to diagnose and solve customer problems without the intervention of support personnel has been announced by **Intellisystems, Inc.**

Techsys can carry on diagnostic sessions with up to 32 users simultaneously. Callers interact with the system using a Touch-Tone telephone. When the system cannot field a call, it is automatically transferred to a customer support representative.

Based on Intel Corp. 80386 processors running in parallel, Techsys can route calls, take messages, handle extension dialing, track products and customers by serial number and support account number and deliver up to 35 hours of information to callers. Up to eight terminals can be added to the system.

Prices start at $38,000 for a four-line system.

Intellisystems, 3946 Stone Canyon Ave., Sherman Oaks, Calif. 91403. 818-906-7575.

A device designed to enable an IBM Personal Computer or compatible to communicate with Group III facsimile machines over standard telephone lines has been announced by **Omnium Corp.**

The **Omnium PC Fax System** provides menu prompts and Help keys and supports merging of text and graphics.

Other features include the ability to send single or multiple documents and to send documents at a predetermined future time, a built-in mail list manager, transmission speeds of 2.4K, 4.8K, 7.2K and 9.6K bit/sec. with automatic fallback, automatic redial, activity reporting, destination polling, send and receive verification and the ability to view received documents on-screen or print them out.

The PC Fax System costs $1,199.

Omnium, P.O. Box 186, Stillwater, Minn. 55082. 800-328-0223.

Links

A **communications option** for the Microvax 2000 has been announced by **Digital Equipment Corp.**

The single-line synchronous communication interface supports DEC's VMS/SNA Software System Version 1.2 and VAX Packet Switching Interface Version 4.1 running under VMS Version 4.6. According to the vendor, it simplifies the connection of the Microvax 2000 systems to IBM host systems. It also supports the CCITT X.25 protocol.

The options costs $1,500.

DEC, 146 Main St., Maynard, Mass. 01754. 617-897-5111.

A micro-to-mainframe software package designed to allow an IBM Personal System/2 to display mainframe graphics has been announced by **Attachmate Corp.**

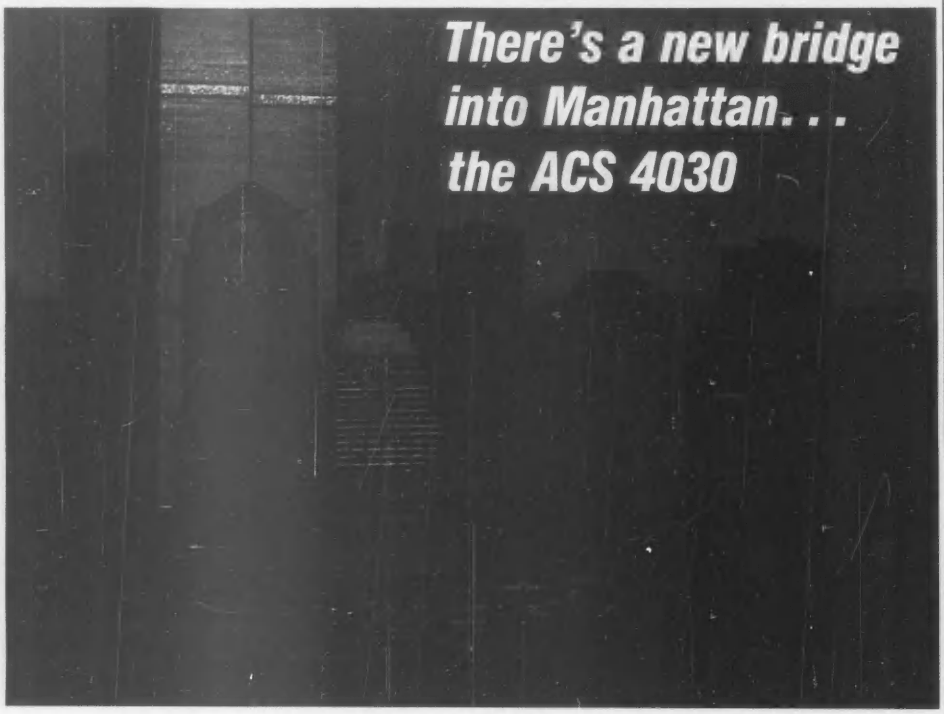
Hypergraph/8514 software uses the on-board graphics processor of the IBM 8514/A adapter.

Hypergraph/8514 is an add-on option to Attachmate's Extra connectivity software, a multiple-session IBM 3270 emulation system.

Extra costs $45. The Hypergraph/8514 option costs $895.

Attachmate also announced the **Advanced 3270 Adapter/2 3270**, a micro-to-mainframe adapter for the PS/2 Micro Channel priced at $595.

Attachmate, 3241 118th Ave. S.E., Bellevue, Wash. 98005. 206-644-4010.



"The ACS 4030 dramatically cut our communication costs and maintained reliability – at a quarter the price of other Ethernet bridges."
Charles Fischer
Director of Operations, Dalcomp, Inc.

Dalcomp, a supplier of online information for the financial industry, needed a better way to connect offices on both sides of the Hudson. Dalcomp had five point-to-point connections using expensive dedicated lines. Dalcomp needed to cut network costs, but couldn't afford to sacrifice network performance. Dalcomp chose the ACS 4030 to connect Ethernets already in place.

Dalcomp saved on equipment costs and cut network charges by 60%. Dalcomp looked into another remote bridge; it was four times as expensive. Dalcomp saved by choosing the ACS 4030 and saved again by reducing the number of dedicated lines from five to two. The ACS 4030 can save you money too.

Saving money doesn't mean sacrificing reliability. Says Fischer, "In our business, we deal directly with major financial institutions. Our service transmits crucial information and we cannot have a down time." Because the ACS 4030 provides load-leveling, if one critical line goes out, the others automatically pick up the slack.

The ACS 4030 fits into your existing system. No need to buy other expensive equipment. And ACC has been developing and supporting networking systems for over 12 years. If you need to connect Ethernets across a river, a parkway, or an entire state, the ACS 4030 can bridge the distance and cut costs, not performance. Call ACC today.

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HARD TALK

Stanley Gibson

SAA: Not cast in stone

If a vendor asked you to sign purchase and sales agreement documents that included the phrase, "Whether or not we support this system and how long we support it depends on how many other people buy it," would you sign on the dotted line?

You would stop and think, that's for sure. But, in reality, that is what users have often been faced with in the past from some vendors.

IBM, reputedly the safest of "safe" vendors, has not been above that strategy. Witness the demise of the 8100, which reached a dead end when IBM decided it was no longer strategically valuable.

Any time a vendor offers multiple architectures, users, analysts and the press always want to know which is really the strategic one. Unisys has been dealing with such questions since the Burroughs-Sperry merger last year. IBM, likewise, with its multiple low-end and mid-range architectures, faces similar questions.

Right now, if you own a small business, are buying your first computer and would like to

Continued on page 63

NAS drive aims to leapfrog IBM

Firm unveils 9½-in. DASD amid performance, space-saving claims

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — In a move that promises to save valuable floor space in mainframe data centers, National Advanced Systems (NAS) recently announced a 9½-in.-diameter direct-access storage device (DASD).

The announcement ran counter to the customary practice of waiting for IBM to move first in the peripherals market. Rather than wait until after IBM's expected announcement of a sub-14-in. DASD sometime in the next two years, NAS went ahead with its 7380 Disk Storage Subsystem Model K. The DASD's 9½-in. platters make it 46% of the size of IBM's 3380 Model K, according to the vendor.

The 7380 Disk Storage Subsystem Model K was originally announced in October 1987, one month after IBM unveiled its Model K, but no information was available at that time on what it would look like.

Bold move

The announcement of the smaller disks is significant "because Japanese suppliers have never been willing to pre-empt IBM," said Dave Vellante, a storage systems analyst at Framingham, Mass.-based research firm International Data Corp. Hitachi Ltd. supplies the systems to NAS. According to a NAS spokesman, Hitachi announced an indentical drive for the Japanese market last week.

Some analysts predicted brisk demand for the drives. "The more adventurous users will buy them," said Bob Katzive, vice-president of Disk/Trend, Inc. in Los Altos, Calif. "NAS has a good reputation as a vendor of drives. People won't worry about embarrassing habits. It won't make a mess on the floor."

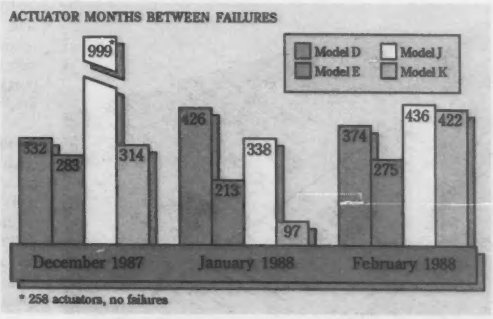
A major auto products manu-

Continued on page 62

Users embrace IBM Models J and K drives

IBM 3380 reliability

New J and K models outperformed older D and E models in February



INFORMATION PROVIDED BY RELIABILITY RESEARCH, INC.
CW CHART

BY STANLEY GIBSON
CW STAFF

Despite some earlier glitches, IBM's 3380 Models J and K are off and spinning, offering users increased storage with superior reliability. A random sampling of initial users of Model J and K triple-density drives found them to be very satisfied with their disk drives.

"The 3380 Model K direct-access storage device is a lot better than the other devices," said Pete Quinn, a senior software analyst at Fingerhut Co., a direct-mail retail concern in St. Cloud, Minn. His shop is populated entirely with 3380 drives,

Continued on page 62

Motorola lengthens 68030 line

BY ALAN J. RYAN
CW STAFF

TEMPE, Ariz. — Aiming to boost its technical systems offerings, Motorola, Inc.'s microcomputer division recently introduced two new systems based on its 68030 microprocessor.

The systems allow users to upgrade to the higher performance 68030 from the 68020 without losing their software and hardware investments, the company said. The machines are targeted at systems integrators and real-time simulation and image processing users.

Both products, part of the VME Delta series, can perform 5 million instructions per second (MIPS), according to the vendor.

The Motorola systems compete against IBM, Hewlett-Packard Co., Digital Equipment Corp. and Sun Microsystems, Inc. offerings in the technical market, according to Thomas A. Beaver, vice-president and general manager of the microcomputer division.

Continued on page 63

Inside

- Sigma designs ruggedized system chassis for Microvax II and Q-bus configurations. Page 64.
- Mitsubishi rolls out 300 dot/in. color printer. Page 64.

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IBM drives

CONTINUED FROM PAGE 61

Models D, E, J and K. He said the reliability of his K models has been about the same as his D models but about five times better than his E model drives. Quinn said his K models have been installed since November.

Satisfaction

Tom Wieland, a data center manager at the Connecticut Bank & Trust Co. division of Bank of New England Corp. in Hartford, Conn., said he is satisfied overall, despite some earlier problems.

"The K model is running just fine. We did have one drive which we couldn't use at all," he said, adding that on another drive, IBM replaced one head-disk assembly (HDA) as a preventive maintenance move. Wieland's shop has eight full strings with four boxes per string.

The supervisor of operations at a Midwestern farm equipment manufacturer also reported having an HDA replaced.

Figures compiled by Reliability Research, Inc. since December 1987 show better than expected reliability for 3380 Model J drives. Early results for Model Ks were not up to par in January, but February reliability figures have shown a sharp rebound (see chart page 61). "The J has been above its competitors from Day 1, and the K is coming along," said Larry Martin of Reliability Research.

K models showed 97 actuator months between failures in January, but that figure leaped to 422 in February. J models had 338 actuator months between failures in January and 436 in February. February figures for both J and K models are above those of both D and E models.

Actuator months between failures is the number of months an actuator can run without a permanent I/O error. IBM HDAs contain two actuators. According to Reliability Research statistics, a failure is a permanent I/O error that requires immediate operator attention. Data need not be permanently lost, however.

Varying reasons

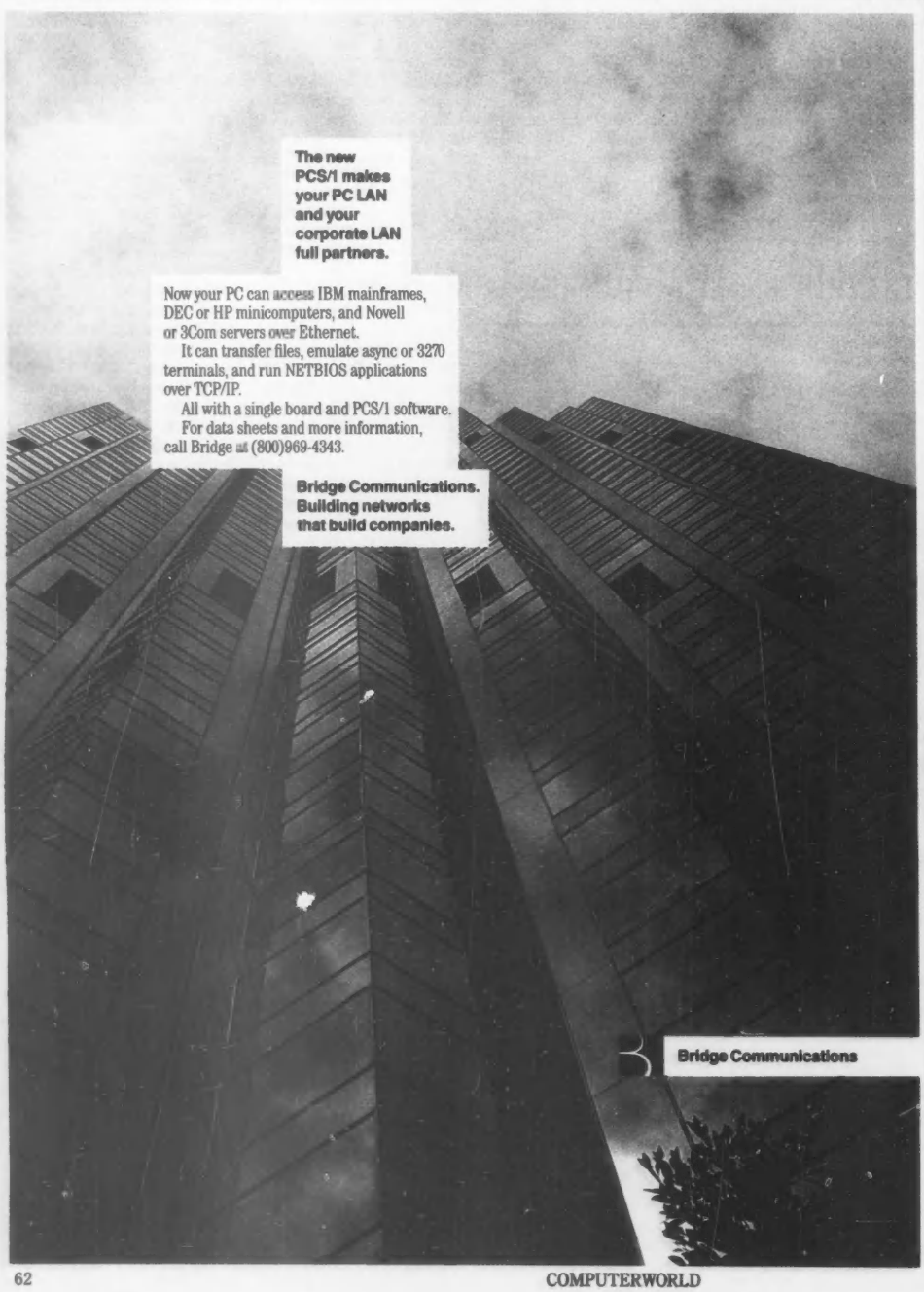
Martin said the low figures for the K drives in January were a result of lower results across a wide range of accounts. However, one account that had a large number of failures said it thought the problem was due to installation and had been cleared up.

Another user, who said he has historically had somewhat strained relations with IBM, had a larger than usual number of problems, according to Martin.

"If I were going to say where the problems were, I would say they would be in the upgrade of the 3880 controller, which is required to run the J and K drives at the 4.5M byte/sec. transfer rate." It's a large upgrade, and a controller can affect an entire string, Martin said.

He also said he talked to four or five Reliability Research customers who indicated the controller had not been quite right after the upgrade was performed.

Martin said that in the past, new disk drives took longer to attain high reliability figures than the J and K models had so far. "Typically, there is a much longer learning curve," he said.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NAS drive

CONTINUED FROM PAGE 61

facturer and large NAS user said he already has a couple of the drives on order. "The smaller space [utilization] is an asset, but not a governing factor. You have to have performance — even if you have to build another building," he said. "They have better performance than equal IBM drives, and the reliability is just unbelievable. Besides, IBM's prices are ridiculous."

Disk/Trend's Katzive said the smaller size, rather than the storage system's other attributes, will drive sales. "The signature [footprint] on the floor is an important economic consideration for users."

Amdahl may counter

NAS's competitor in the IBM plug-compatible market, Amdahl Corp., has never had a 14-in. DASD. It originally announced a 10½-in. disk storage system in 1982. A spokesman for the company said he expects new storage technology announcements this year, but he would not specify a product.

NAS's Model K can pack eight head-disk assemblies stacked vertically into a standard cabinet, according to the company. Each assembly can store 1.88G bytes of data, compared with IBM's 3.75G bytes. A full configuration consists of four cabinets, rather than the eight needed for IBM's Model K.

Average seek time, according to NAS, is 12.5 msec, and 1 msec is the minimum seek time. This is 25% and 50% faster than IBM's Model K performs, according to NAS.

No price has been named, but according to the company, the list price will be 90% of IBM's asking cost.

Due to its smaller size, NAS said, its Model K will use 25% less power than IBM's.

The DASD can allow four independent data paths to each actuator, enabling four transfer operations to be carried on at the same time. And it can be hooked up to the NAStrack diagnostic system to monitor and analyze it for performance, the vendor said.

NAS is slated to begin shipping a limited supply in the third quarter. The company said it expects to ship in quantity by early 1989.

Gibson

CONTINUED FROM PAGE 61

buy from IBM, you are faced with four choices. You could buy a Personal System/2 local-area network, a System/36, a multiuser RT Personal Computer or, possibly, a 9370.

Given that you could find a suitable application on any of these, which should you choose? The presence of an incremental, easy to implement, reasonably priced growth path that could protect your software investment would be perhaps the next most important decision after finding an application.

Are all growth paths the same with all these systems? Will IBM continue to offer wholehearted support for them all?

Cast your ballot

During a recent interview, Frank King, vice-president of development for IBM's Entry Systems Division, was questioned at length as to which were IBM's entry-level systems of choice. King responded that it is better to have choices than not to have them. In the end, he said, "the market will vote" for the systems it wants.

That sounds fine. That means the customer is always right. But does this mean there will be winners and losers? That some processors won't get enough votes and will go the way of Gary Hart and Alexander Haig?

In the past, there would be no way to get around that conclusion. But now there is IBM's Systems Application Architecture (SAA). Under SAA, even if the hardware system you choose does not evolve the way you wish, you can migrate your application to a more appropriate platform. Or so we have been led to believe.

Thus, SAA becomes a panacea for all growth and migration anxieties. With SAA, IBM offers more safety than Fort Knox. An entry-level IBM customer with migration concerns should really ask, How much can I believe in SAA? Is the system I am buying fully supported under SAA? Here, you are buying a promise.

At least with the System/36 and 38, it's a promise that is very unspecific. Neither RPG II nor RPG III, the programming languages for those systems, has been announced under SAA. We probably must await the arrival of Silverlake to resolve this dilemma. Until then, System/36 and 38 users will be left to sport the anti-SAA buttons that they were seen wearing at a recent meeting of the Common users group.

SAA, although critical in protecting user investments, is not cast in stone. IBM has indicated that SAA will evolve, just as Systems Network Architecture evolved in networking. Because it can change, it probably will, and one can't be sure that SAA will always solve all migration problems.

In fact, even SAA could be a hedging decision. If it began to look like a group of users of a certain language or architecture had little requirement for the benefits of SAA, then support could be curtailed on those languages or architectures. SAA will only come to full fruition if there continues to be strong user demand across a variety of systems for such an offering for several years.

The requirement of SAA, cross-system consistency, has long been a demand of some users and their organizations, such as Guide International. If demand should dry up, then it's a fair bet that SAA would go the way of certain Gothic cathedrals in Europe that have, to this day, never been completed.

Despite the importance of SAA in guaranteeing a customer's investment, it's probably impossible to get a written statement from IBM specifying what SAA will or won't do in the future. SAA, in all likelihood, will always be a promise.

As such, users should examine it very carefully. A entry-level user should ask, "Will I need SAA and will it be there when I need it?" Users should be as specific as possible in pinning IBM down on what SAA features are scheduled to appear and when.

Gibson is *Computerworld's* senior editor, systems & peripherals.

Motorola

CONTINUED FROM PAGE 61

Among the new systems are the Model 3600, a Unix system targeted at the large work group systems market, according to Glenn Lesniak, systems product manager for the VME Delta series. The 3600's basic configuration provides 4M or 8M bytes of memory with a single-board computer leaving 11 VME slots open for application-specific expansion.

The Model 3600 reportedly supports up to 132 serial connections and up to 1.2G bytes of mass storage. The model is geared toward software development and applications requiring large data storage capability. When more power is needed, the processor capability of the 3600 can be doubled by moving up to an 8 MIPS cache processor, Motorola said. Pricing starts at $11,895 in OEM quantities, and shipments are slated to begin in June.

The company also announced the multiuser Unix-based VME Delta series Model 3300, targeted to serve the open technical systems platform market. The basic system will sell for $6,995 in OEM quantities, and shipments are scheduled for next month.

The Model 3300 is a six-slot system geared toward commercial, technical and networking applications, the company said. It reportedly can support up to 8M bytes of memory, up to 300M bytes of disk storage and up to 20 users or asynchronous devices.

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NEW PRODUCTS

Processors

A ruggedized system chassis designed for Digital Equipment Corp. Microvax II or LSI-11/73 Q-bus configurations has been announced by **Sigma Information Systems.**

The **SA-H169** supports four drives. Drive access is via a front door. A 500W power supply with power-fail circuitry is self-contained.

The SA-H169 costs $9,167.

Sigma also announced a freestanding enclosure that expands Microvax II or Microvax 3200 systems by providing additional backplane slots.

The **SA-H162** enclosure includes attachments to expand the Microvax with 16 additional dual-Q22 backplane slots and up to four additional 5¼-in. pluggable disk drives. It costs $3,750.

Sigma, 3401 E. LaPalma Ave., Anaheim, Calif. 92806. 714-630-6553.

Data storage

Digital Equipment Corp. RA series-compatible disk drive subsystems have been introduced by **Distributed Logic Corp.** (Dilog).

The **Fixed Disk RA** subsystem provides up to 2.3G bytes of storage per unit. The **Quick Disconnect RA** subsystem provides data security and portability. Both employ a protocol conversion board that translates from the Storage Module Device or the enhanced small device interface protocol to DEC's standard RA-compatible SDI protocol.

A Fixed Disk RA subsystem with two 576M-byte drives costs $28,802. A Quick Disconnect RA subsystem with two 288M-byte drives costs $22,884.

Dilog also announced an 8mm streaming tape subsystem offering up to 2G bytes of storage capacity per tape cartridge for backup of hard disks in DEC Microvax, VAX, PDP-11 and LSI-11 computers. It costs $6,855.

Dilog, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806. 714-937-5700.

A Sun Microsystems, Inc.-compatible storage module device VME disk controller has been announced by **Xylogics, Inc.**

Called the **Xylogics 753**, the board is compatible with the Sun-3 Eurocard board set. According to the vendor, it combines a 128K-byte first-in first-out cache architecture with read-ahead and the company's Dynathrottle direct-memory access (DMA) control. It supports disk speeds up to 3M byte/sec.

The Xylogics 753 also provides full 32-bit support and is 100% compatible with SunOS, the vendor said. Capabilities include setting interrupt and vector levels and changing DMA parameters as well as scatter/gather support, asynchronous command queueing and enhanced 48-bit error correction control.

The Xylogics 753 costs $2,895.

Xylogics, 53 Third Ave., Burlington, Mass. 01803. 617-272-8140.

Printers/Plotters

A 600 line/min. matrix line printer has been announced by **Output Technology Corp.**

The **OTC 2161** features a two-line-per-pass printing technique, the vendor said. Other features include two expansion slots for user-installable option cards, built-in bar codes, dot-addressable graphics, downloadable fonts and font cartridge capability. Centronics Data Computer Corp. and Dataproducts Corp. interfaces are also included.

Standard emulations include the Printronix, Inc. P6080 and the Epson America, Inc. FX-286E.

The OTC 2161 costs $6,450.

Output Technology, Suite #6, E. 9922 Montgomery, Spokane, Wash. 99206. 509-926-3855.

A 300 dot/in. color printer has been introduced by **Mitsubishi International Corp.**

The **Shinko CHC 345** is an A size printer said to be capable of producing more than 270,000 colors. It features four-color ribbon support and a tractor feed. Also available is the **CHC 645** D size printer. It features a full-page buffer.

The CHC 345 costs $6,000. The CHC 645 costs approximately $12,000.

Mitsubishi, GMD Dept. B, 520 Madison Ave., New York, N.Y. 10022. 212-605-2343.

A 40 page/min laser printing system has been introduced by **NBS Southern, Inc.**

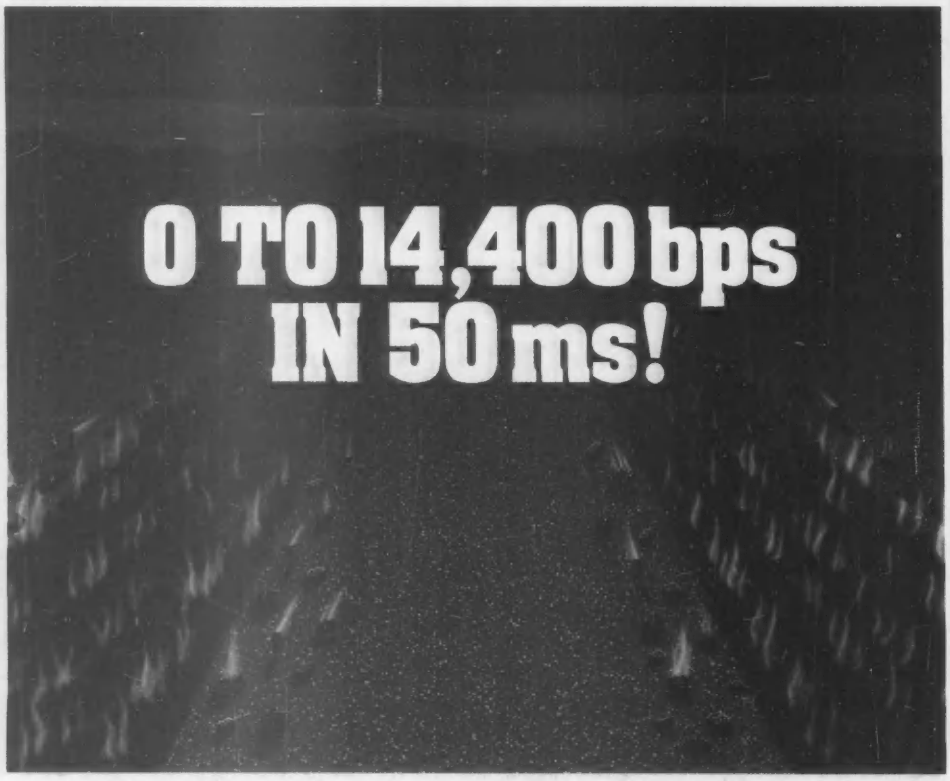
The **Model 3840** has a standard resolution of 300 by 300 dot/in. and comes with 42 resident fonts. Resolution of 240 by 240 dot/in. is available as a factory option, and total font storage can be expanded to more than 100; the full Bitstream library of fonts is supported, the vendor said.

Plain cut-sheet paper can be accommodated. IBM and Digital Equipment Corp. interfaces can be used to drive the Model 3840.

The printer can operate in a computer room or remotely. It offers imaging capabilities and forms design; graphics images may be presented as input from a personal computer or workstation.

The Model 3840 costs $45,000.

NBS Southern, 100 N. Belcher Road, Clearwater, Fla. 34625. 813-441-1981.



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UDS Trellis Coded 14.4A/B Modem

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For detailed specs and quantity prices, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 800-451-2369; Telex 752602 UDS HTV.

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A lender, a vendor and a micro defender

Tales of three women who gained power in the industry

BY MARGUERITE ZIENTARA

Power. The very word does something to people — especially those without any. It goes hand-in-hand with money, prestige and freedom and, therefore, carries with it the promise of all the things millions of people strive for every working day.

The women described here — Portia Isaacson, Therese Myers and Jacqueline Morby — gained power and made their mark in one of the most fast-moving and unpredictable industries ever to emerge. The microcomputer burst onto the scene in the mid-1970s, and popular culture hasn't been the same since.

Historically, most women have avoided the technical world. But a few who dared and persevered in this industry have reaped great rewards: Several are multimillionaires; all are highly respected within the industry.

.....

Although, of course, no one person can take full credit for creating an industry, Portia Isaacson has very possibly done more than any other person to help shape the microcomputer business. Isaacson was a true pioneer of personal computing, having opened one of the first microcomputer stores in the nation with her then-husband in 1976 — only one year after the microcomputer had become a reality.

"I became well known because I was really evangelistic about personal computers being the most important technology the computer industry's ever brought to mankind," Isaacson says.

She rather quickly became *the* expert on personal computers. "I experienced everything about the industry as it grew," Isaacson explains. "I lived through all its mistakes."

Isaacson also founded the first, and at one time the largest, microcomputer-related market research firm in the country, Future Computing, Inc. in Dallas. Future Computing — which was sold to McGraw-Hill, Inc. in 1984 — was for years the only source for hard statistics about microcomputer sales.

P. CHARLES LADOUCEUR

Dreaded news

While sales of IBM's Personal Computer were fueling Isaacson's business, IBM cast a long shadow across the paths of many other gifted innovators. One survivor is Therese Myers, cofounder and president of Quarterdeck Office Systems in Santa Monica, Calif.

Quarterdeck's story started out on a high note. In its first full year, 1982, Quarterdeck was able to attract $6.4 million in venture capital and the firm suddenly became "something to watch."

The cause of such a stir was a

Zientara is Boston bureau chief for *Computer Currents* magazine and a former senior writer for *Computerworld*. This article is excerpted, by permission of the publisher, from *Women, Technology & Power*. ©Copyright 1987 by Amacom, a division of American Management Association, New York. Reprinted by permission. Available in bookstores.

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• Future Computing's Portia Isaacson

• Venture capitalist Jacqueline Morby

• Quarterdeck's Therese Myers

new idea for integrating software. Quarterdeck had a working prototype called Desq, which would allow a user to combine up to nine application software packages of choice from different vendors and switch back and forth among them easily. The idea was unique, brilliant — and obviously worth a lot of cash.

But after the hard work of developing Desq, Quarterdeck was in for a real shock. Just three months after Desq finally came out, IBM preannounced Topview.

Life can be dangerous for a small company with a single product. Once IBM gets that gleam in its eye, it can call on its army of development and marketing personnel to bring a product to fruition quickly and lay it out before the public.

"It just proves Desq was a brilliant idea," Myers said then, unconsoled by the thought.

But Quarterdeck has survived. Desq and its follow-up product, Desqview, received excellent reviews, which is more than IBM can say about Topview. Quarterdeck surprised many observers who wrongly sensed a sinking ship.

The battle isn't quite over for this company, but you won't see Myers waving a white flag anytime soon. In an industry where any software firm has only a 50-50 chance of surviving beyond its fifth year, Quarterdeck has already beaten the odds.

Timing counts

Jacqueline Morby started out in venture capital in the early days of the personal computer industry. She helped shape the industry by pouring $8 million into fledgling micro software companies for her Boston employer, TA Associates, one of the oldest and largest venture firms in the country.

It's not *how much* she invested that sets her apart, however, but *when* she invested it. Morby was one of the first to discern the lucrative potential of micro software in the late 1970s, and she helped blaze the investment trail.

In spite of some doubt and controversy within her own company, she recommended — and TA made — four highly promising investments in software companies.

Morby, who reentered the business world after 15 years as a homemaker, immediately got onto a fast track, both within her company and out in the world at large. Her controversial risk taking paid off big, for the software industry and for her personally. Only four years after joining TA Associates, she was made a general partner.

.....

On being powerful

"By giving great value in our society, you get great rewards back," Isaacson says. "In hindsight, I spent my life building unique value. That is, if you have anyone who competes with you in skills or in products, then that limits the value of what you offer, because someone else offers it too."

When Isaacson realized in college that physics was the most difficult of the sciences, she decided, "I will be a physicist." She reasoned that if she became something that few people were, she would easily be able to make a living.

> "YOU don't have to act and look tough to be tough. It's easier with friendliness and niceness instead of confrontation."
>
> JACQUELINE MORBY
> TA ASSOCIATES

Although she went on to become possibly the most influential voice in the PC industry, Isaacson has reservations about how to describe herself.

"The word 'powerful' turns me off a little bit, but if you'll allow me to think of it in a positive way, the answer has to be yes, [I am powerful]. We use the word 'influence' most often."

Like others, Isaacson feels keenly the responsibility that goes along with power. "In our own company, we discuss a lot what influence means and how we should manage it," she said when she ran Future Computing.

Morby, like many other women in business, feels her polite exterior belies her true nature. "People misjudge me," she says. "They wonder, 'Is she tough enough?' They don't understand there's a difference.

"You don't have to act and look tough to be tough. Your mannerisms can be friendly and nice, but underneath is a determination to achieve what you want to achieve. It's easier with friendliness and niceness instead of confrontation."

What Morby may not realize is how others see her. "She has a powerful presence," says one industry observer. "When she walks into a room, you know she's there."

Morby, though, has amazed herself. "It surprised me that I was as aggressive and competitive as I am," she says. "I really want to have the best investments and do the best. I need to compete."

As a company, she says, "We're dealing with people's dreams. And those dreams can come true because we're able to say, 'We think you've got something here, and we think you can do it,' and give them the pure start-up money to start a company.

" 'Power' is not the right word, but I guess a venture capitalist does feel a sense of responsibility to all these dreams," Morby says.

Quarterdeck's Myers does not in any

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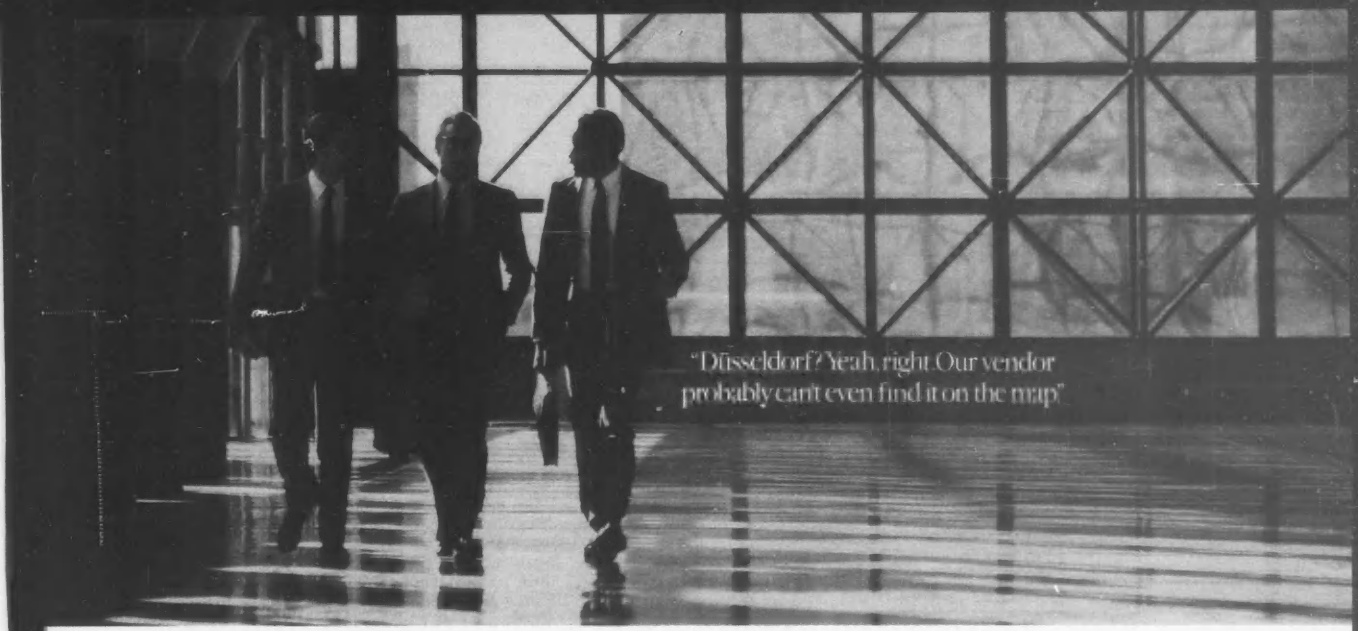

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way see herself as powerful. "No, we're a small company," she says. "Our work was done as a team effort. None of us could have done it without the others. I couldn't have done it without [cofounder] Gary [Pope]."

Power, however, resides not necessarily in numbers but sometimes in attitude. Myers and Pope had to have the daring to compete, as well as a strong survival instinct and the mettle for sticking it out through the hard times. For Quarterdeck, with a dozen or so employees, to compete against Microsoft Corp. with its hundreds and IBM with its thousands takes guts.

Myers won't take the credit, but she is undoubtedly a large part of the company's success. "Terry Myers is a great manager," a Quarterdeck publicist says. "She's rarely wrong. She has the thoroughness of the small-business mentality but the strategic capability of a corporate executive."

.....

On being female

"Women at all levels generally set their goals too low," Isaacson says. "How many women would think of leaving Intel or Texas Instruments and going after venture capital to start their own company?" she asks. "It's a very important point that very few women set their goals on doing that."

"There are more women in power in the micro industry than anywhere else, certainly compared with the Fortune 1,000 companies," Morby says. "There are women heading companies and many vice-presidents of marketing.

"I've never had problems being female," she continues. "In the beginning, when I was first calling on companies, I worried they might look at me as a woman and not want to deal with me. But they were always interested in my background, how I got into the business. It was more of a curiosity than anything else."

The scarcity of women worked to Morby's advantage in some cases. Entrepreneurs unaccustomed to dealing with women in business were often surprised into letting down their guard. "I sometimes find out incredible things that the entrepreneur really shouldn't tell me," Morby told *Business Week* in 1981, "and then I don't invest in the company."

Isaacson also feels that being a woman was a plus but in a different way from most.

"In front of an audience, I get by with things a normal person wouldn't, in a way a three-piece-suited guy wouldn't," she says. "It's because they have no set of expectations, because I'm not out of any mold. In fact, at that point, being female becomes very much an advantage, except for the occasional guy who's threatened by it. But they're very rare nowadays."

She understands, though, that her dynamism can backfire. When Isaacson speaks in public, she holds her audience in the palm of her hand through a combination of dramatics, startling opinions and sheer personal magnetism. "I'm reasonably entertaining," she says, "and 90% of the audience winds up liking me. But the rest are thinking, 'My God, what a brassy, ballsy, yucky lady!' "

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In the nick of time

The excitement surrounding the micro industry was just about to break when Morby found her way into that enclave. By 1980, several factors had combined to put Morby into a valuable position. For one thing, political changes had suddenly made high-tech investments very attractive to venture capitalists. In 1978, thanks largely to the efforts of the American Electronics Association, the capital gains tax was lowered from 48% to 28%. This meant that success was newly affordable — and the money people wasted no time.

Whereas in 1977 venture capital firms had committed $39 million to invest in new businesses, that figure skyrocketed the very next year to $570 million — almost 15 times as much.

Naturally, besides making billions of investment dollars available, the situation also created a need for more people capable of making the investment decisions. The year the money would start to fly, Morby graduated from Simmons Graduate Management School and joined the world of venture capital full-time.

From her first day at TA Associates in Boston, Morby was on her own. "You don't get a lot of help or coddling here," she says. Besides being a self-starter, Morby is very intuitive, which has contributed to her personal success. "You have to judge and understand people. I'd say it's 30% to 40% of our job."

Some credit also goes to her experiences in South America, where her husband's work had taken the family several years earlier. "Down there, I was dealing with uncertainty all the time," Morby notes. "I was negotiating my way around in another language, and there was always unfamiliar territory, both physically and socially. I think it was good training."

> "NOTHING is more exciting than to find a company that's a terrific investment. It's like discovering gold."
>
> JACQUELINE MORBY
> TA ASSOCIATES

With keen insight, she soon identified the then-neglected area of mainframe software as potentially lucrative. "It seemed to me then that hardware was going to become more of a commodity," she explains, "and software would be where the value existed in computer systems." That happened to be a fundamental truth that was not yet obvious, even to most people in the computer industry.

It was not an easy road. Morby made cold calls on about 100 companies in 1978 to 1979, and at least 30 of those were mainframe software companies. Many didn't need venture capital; some had never heard of it. It fell to Morby to educate them, evaluate her prospective investments and, if they looked promising, try to persuade them to accept venture capital in return for bargain-basement-priced stock in the company.

Morby's scores of company visits resulted in just three mainframe software investments: McCormack & Dodge Corp. in Natick, Mass.; Capex Corp. in Phoenix; and AIcorp, Inc., formerly Artificial Intelligence Corp., in Waltham, Mass. McCormack & Dodge and Capex were later sold, giving TA Associates its payback, and Morby has a seat on the board of directors of AIcorp.

'Interesting' frontier

Having gained entrance into the mainframe software arena, Morby began to hear rumblings about microcomputer software and figured, "there must be something interesting here." Her timing again was exquisite.

Morby's hard work and intuition led her to four micro software investments: Digital Research, Inc., maker of the CP/M operating system; Sierra On-Line and Spinnaker Software Co., on whose boards of directors she sits; and Softsel Computer Products, Inc., one of the largest distributors of microcomputer software.

"Nothing is more exciting than to find a company that's a terrific investment," Morby says. "It's like discovering gold."

While Morby knew exactly what she was doing, her early investments in micro software did not always earn the approval of her colleagues. "Spinnaker was a controversial investment around here because the principals weren't from operating backgrounds," she recalls. They were two sharp Harvard Business School graduates, working in high-tech-oriented Boston consulting firms.

As it turned out, it was the two Harvard graduates who almost turned Morby away. One of them dropped in at TA Associates' office on a fact-finding mission, hoping to see the manager of the office. Instead, the manager's secretary told him, "Jacqui Morby will see you." Morby then suggested lunch.

"I didn't want to have lunch with her," admits Bill Bowman, Spinnaker's cofounder. What Bowman didn't realize was that the manager he wanted to see was actually junior to Morby.

"I didn't know who [Jacqui Morby] was — a secretary or what," Bowman recalls. "I had never heard of her. But a consultant never misses an opportunity to B.S."

Over coffee, Morby asked Bowman, "Why don't you and Dave work up something we can finance?" He and Dave Seuss, his partner, did, and Morby liked what she saw. In May 1982, Spinnaker got its first infusion of venture capital — $800,000 from TA Associates.

"If we hadn't taken them on, who knows if they would have been financed by other people?" she asks. Others saw it as something of a long shot, but Morby's belief in her own judgment was quickly justified.

"Spinnaker was unbelievably successful," she says. "In four months, they had products out in the marketplace, and they were beating the projections all along the way."

Changing with the times

Of course, only the future will tell how successful Morby's investments really were. The industry shakeout and slump of 1985 to 1986 have added up only to a disquieting uncertainty. Failure is an ever-present possibility — and therein lies the most difficult part of Morby's job. "When your companies don't do well, it's upsetting," she says. "It's not fun to lose money. It's embarrassing for you and for the firm, and it's difficult because you feel responsible: The investors put their trust in you. But ultimately you do [lose money], sooner or later."

Every year, TA Associates makes 30 to 40 investments in all areas of technology — and occasionally in other areas of business — and rejects out-of-hand about 1,000 business plans that come over the transom.

Morby and other first-wave micro venture capitalists, of course, moved out of the micro arena long ago, on to such other areas of technological interest as telecommunications, data communications, semiconductors and networking systems. "The microcomputer industry is no longer an interesting area for investments," Morby says.

Morby's reasons delineate

Off to a good start

• Morby

Born Jacqueline Collins, June 19, 1937, in Marysville, Calif. Graduated from Stanford University and Simmons College Graduate Management School. Work experience: writing, student teaching, market research, volunteer work for art institutions and venture capital. Spent five years, 1969 to 1974, in Argentina and Brazil. Married to Jeffrey Morby; has two children.

• Myers

Born July 1, 1944, in McKeesport, Pa. Graduated from Newton College of the Sacred Heart, Carnegie-Mellon University's graduate program in industrial administration and Northwestern University's master's degree program in accounting. Work experience: international banking, accounting, leasing, on-line systems and product design.

• Isaacson

Born Portia Midgett, Sept. 7, 1942, in Oakland, Calif. Childhood heroine: Marie Curie. Graduated from Oklahoma East Central State College, North Texas State University's master's degree program in computer science and Southern Methodist University's Ph.D. program in computer science. Work experience: dairy farming, industrial chemistry, U.S. Army, teaching, programming, retailing, consulting and speaking. Married and divorced five times; has three children.

CW CHART: AMY J. SWANSON

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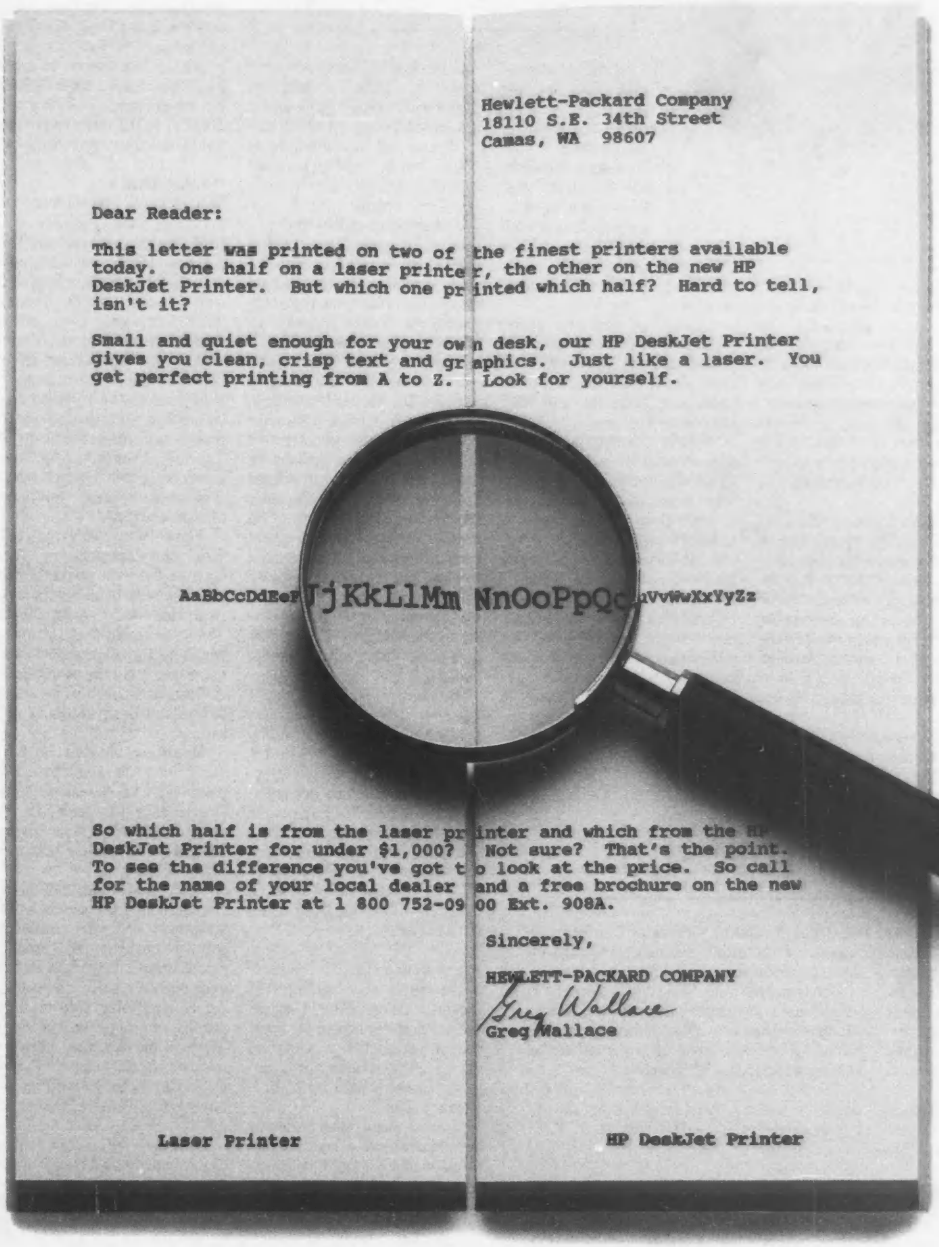
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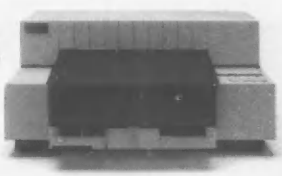

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perfectly the current state of the industry. "The market's changed dramatically and is now dominated by one company — IBM — so the micro area is not a new market anymore," Morby explains. "Suddenly it's an industry of big companies."

But it was fun while it lasted. "Seldom in the history of venture capital investing has there been an industry where companies could grow so large so quickly," Morby notes. "I don't think there will be similar instances in the future where growth is so rapid and there's such a boon for investors."

.....

First of a kind

Before Myers' Quarterdeck Office Systems started developing its Desq product, there was no such thing as an operating environment.

While the rest of the world was going bananas over integrated software, this company turned the concept of integration inside out. Quarterdeck's idea was to let users indulge their old habits while gaining more versatility at the keyboard.

"We said, 'We'll take on the burden of being smart — of making all these programs run together, because people have lots of files written for different software, and they've already developed work habits using that software,' " Myers explains.

In the words of one admirer, Quarterdeck came on the scene as nothing less than the Great Liberator. "Terry Myers represents the freedom of the Western mind," says Stanton Kaye, a filmmaker who has done promotional work for Quarterdeck.

"WE'LL TAKE on the burden of being smart — of making all these programs run together, because people have already developed work habits using that software."

THERESE MYERS
QUARTERDECK OFFICE SYSTEMS

1984, "I hate machines. I can't really operate them. I'm the one who says, 'I can't make this work,' and my colleagues go back and make it easier for me."

She is skilled at avoiding a frequent mistake developers make: assuming the user knows as much as they do. "I'm a user of computers but not really adept," she admits, "so I like things to be obvious."

In developing what would become Desq, technical wizard Gary Pope wrote his own artificial-intelligence-like development language, which he called Simple. Begun in September 1981, Simple was finished by the following April, and the developers spent a grueling six months writing the intricate code for Desq.

But November 1982 brought some startling and unwelcome news. With Quarterdeck still still deep down in the minor leagues.

"I called Gary and said, 'It looks just like us,' " Myers recalls. The blow to Quarterdeck was severe, since the world now began its wait for windowing software from a proven hard-hitter, while Quarterdeck was

During the next two years, Quarterdeck suffered other major setbacks as Microsoft, then IBM, joined the race. Microsoft announced Windows, and IBM introduced Topview.

Initially dismayed, Myers soon channeled her mental energy into the satisfaction that Desq was a more powerful product.

Only Desq allowed someone to keep using his favorite Microsoft MS-DOS software packages from different vendors, while allowing up to nine applications to be displayed at the same time on one screen. At the time, the preannounced but nonexistent competition was "tightly coupled," a limitation that meant it could integrate only its own application packages or other vendors' specially rewritten versions.

one block from Santa Monica's sparkling Pacific, working six days a week, keeping at it until 2 a.m. at least every other night.

"Desq was a nightmare in some ways," Myers says. "Much of the software out there bypassed standard DOS programming conventions in the interests of speed and performance, so it needed changes. And every time, we had to figure out how its programmers had bypassed conventions. It was a trial-and-error process."

But there were bright spots, even during this discouraging period. In December 1983, Quarterdeck attracted another $5.6 million in its second round of venture financing. And during 1983 alone, Myers had turned down four offers from companies that wanted to buy Quarterdeck. All four suitors would have kept Quarterdeck's top management in place but wanted to relocate the company. Myers was tempted, but after careful consideration, she said no. "The company's ours. That's what makes it exciting."

By May 1984, Desq finally went out the door, and the kudos finally came in. In June, "The Seybold Report" newsletter deemed Desq "limitless in its potential" and called its documentation "the best." A July review in *Infoworld* magazine called the software "big, powerful, effective and complex." The October *IBM PC Update* called Desq "a delight." All in all, Desq again felt like a hit.

Place in the sun

While 1985 was nothing but trouble for most of the PC industry, ironically it brought a great deal of satisfaction to Quarterdeck, longtime underdog to industry leaders Microsoft, Visicorp and IBM.

Even though Quarterdeck's business suffered as much as any other company's from the industry slowdown that year, at the same time its Desq software came into its own as, one by one, its competitors' products hit the store shelves.

After the shock of Aug. 14, 1984, when Myers witnessed the unveiling of IBM's strikingly similar Topview operating environment, Quarterdeck immediately laid off 20 low-level employees (nearly half its total) and consulted Arthur D. Little, Inc. for a prognosis. That company rightly predicted that the industry would go through a period of evaluating Desq against Topview — once it finally appeared — as well as against Microsoft's Windows, slated to come out later in 1985.

Early in February 1985, there was rejoicing in Santa Monica when Topview was finally released. Proud as IBM was of its product, Quarterdeck was even more proud of Desq, which it felt was the hands-down winner between the two.

The critics seemed to agree. "Topview debut stirs little interest among major software vendors" read the front-page headline in one industry publication.

Double blade

With the ever-present irony facing those who compete with IBM, its rivals hoped that the success of Topview would validate the philosophy behind their own products while simultaneously showing them off to competitive advantage.

At the same time, rivals hoped to ride on the coattails of IBM's success by adjusting their windowing software to accept programs written specifically for Topview. They would be "Topview-compatible," which meant they would become a viable alternative to IBM.

Immediately after the Topview announcement, in fact, Quarterdeck had started working on a streamlined version of Desq that would be completely Topview-compatible. Desqview would be for more casual computer users, not the power users of Desq. It would also be easier to use than Desq, yet more versatile.

Desqview shipped in May 1985 with an attractive $99 price tag. At the same time, Quarterdeck dropped Desq's price to $199 from the original $399. IBM's Topview remained priced at $149.

IBM, meanwhile, true to its commitment to Topview as its strategic software product, started pushing the product more aggressively than it had ever pushed a software product before. That May, IBM caused a stir by offering free copies of Topview and two other software packages (one being Software Publishing's Assistant Series) to buyers of its Personal Computer XT.

The 90-day promotion caused dismay among IBM competition, who considered it predatory, and Janelle Bedke of Software Publishing Corp. went on record as being unhappy because the offer could be seen to diminish the perceived value of her company's Assistant series.

A month later, IBM was giving away more free copies of Topview, this time to selected volume users. IBM had often given away demonstration disks (falling short of a complete program but suggesting its capabilities), but this marked the first time Big Blue had parted with

Twenty-twenty foresight

"Adam Osborne was a reference of Gary Kildall when I made the DRI investment," recalls Jacqueline Morby, general partner at TA Associates venture capital firm. "So when I called Adam, he said, 'Hey, I'm putting together a company called Brandywine Computers, so I'll send you the business plan.' For a long time I looked at Brandywine but I didn't [invest in] it."

Brandywine Computers turned into Osborne Computer Co., a flashy high roller whose performance was spectacular for a time. And every milestone of Osborne's increased Morby's wistfulness. "I regretted [not making the investment] for a long, long, long time," she admits.

But Osborne went bankrupt in September 1983, only five months after abruptly pulling out of its scheduled initial public offering. It turned out to be the failure that marked the beginning of the decline of the industry.

"Now I don't regret it anymore," Morby notes, "because I would have lost my money. But it looked awfully good for a long time."

MARGUERITE ZIENTARA

Of course, not everyone saw it that way, especially the legions of integrated software proponents. Quarterdeck set sail squarely in the face of the prevailing wisdom. But total dedication to the company was the hallmark of the Quarterdeck crew as it set about creating this new kind of software.

Also invaluable was Myers' natural ability to put herself in a nontechnical person's shoes. As she told *Fortune* magazine in more than a year away from having a finished product, a chillingly similar software product was displayed at the micro industry's major trade show, the semiannual Comdex.

The well-established and respected Visicorp had announced its Vision windowing software. For most of the technical community, the concept of windowing or integrating was new, and Visicorp was the first to tout it publicly.

Preannouncements certainly plagued Quarterdeck, but there was yet another unforeseen challenge — that of making Desq work with existing MS-DOS programs. Quarterdeck had to modify and remodify Desq to accommodate every MS-DOS program the company wanted on its "100% compatible" list. For six months, from December 1983 to May 1984, 11 developers and testers sequestered themselves in cramped offices

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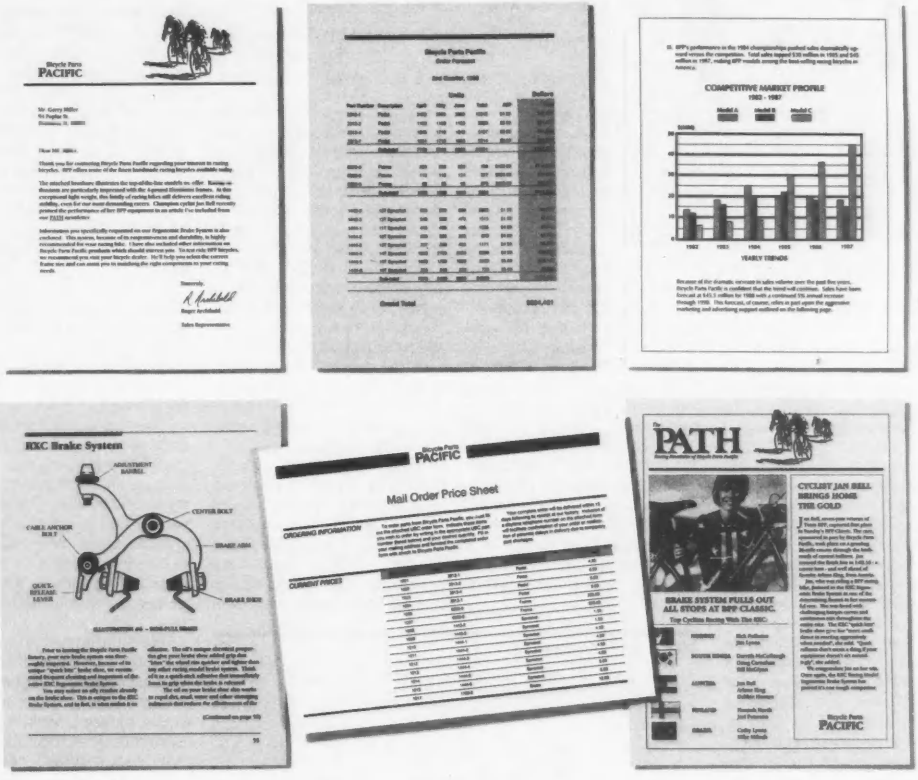

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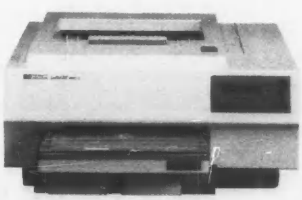

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One has to wonder how a tiny company like Quarterdeck could continue to survive in such a climate. Who but IBM could afford to give away tens of thousands of free copies of its software? On the other hand, it could be said that IBM couldn't afford not to give Topview away — considering the lukewarm reception it was getting.

In June 1985, *Infoworld* concluded that Topview was "slow, memory-hungry and requires far too much technical knowledge." And even a free copy doesn't guarantee that anyone will use it.

By the end of 1986, however, more than 250,000 copies of Desq/Desqview were said to be in use, mostly by corporate power users. Myers remained confident that time would bring a surge in demand. "Given the choice, would you rather prepare a nine-course meal on a hot plate or on four burners and an oven?" she asks.

Trump card

Despite the formidable industry troubles of 1985 to 1986, Quarterdeck hung in there with a product that could only be considered a bridge to the future. Far more powerful computers — with extended memory and faster microprocessor chips — were just around the corner, and operating environment software would be the first to maximize the new technology.

If the technology evolved as expected, it would play right into Quarterdeck's hand. Many computer users were envisioning being able to routinely run several programs at once, exchange data among programs and files instantaneously and generally work the way office workers have always worked, whether they're secretaries or executives — namely, with interruptions.

It would take savvy, patience and continued sales for Quarterdeck to see itself, and the industry, through to the next phase of office automation, but dedication is one thing the company has never lacked. "You have to have staying power, I think," Myers says she guessed early on. And she's got plenty.

.....

Influential

"What Future Computing has done that is not public knowledge — particularly in our early days — is more important than what is [public knowledge]," Isaacson claims. "Although I can't discuss it, I have worked with nearly every major computer manufacturer that has come into the retail channel, and I've influenced each one's whole approach to that channel."

Isaacson's and Future Computing's involvements with manufacturers have called for hammering out serious details, such as the terms and conditions of a vendor's market-entry plan, identifying which and how many stores a product should be in and developing product rollout strategies.

"That's how we're inside the industry at the bargaining table," Isaacson explained while at Future Computing. While other industry analysts — like Esther Dyson, for example — may be privileged to see new products before they are officially introduced, they're not generally in on the decision to produce them.

The fast growth of Future Computing in its first four years mirrored, and in fact was intertwined with, the growth of the PC industry itself. The fact that some of the biggest names in the minicomputer and mainframe businesses came calling on Isaacson for advice about their micro plans gave her enormous influence in helping to shape the micro industry.

Future Computing was one of the few sources of hard facts and figures in existence, since it had shrewdly established a network of 1,000 representative computer and specialty stores that faithfully reported their actual sales figures each month. While most market research firms relied only on vendors or distributors for unit sales information — which was often inflated to make everyone look good — Future Computing's sales data was inarguable.

Risky business

Its long-range projections, on the other hand, sometimes were not. Although Future Computing built its reputation on early and accurate insight into the potential impact of the IBM PC, the firm later came to be known for predictions that often turned out to be too optimistic. In the fast-moving personal computer world, fortune-telling is by definition very risky business.

Future Computing projected in 1983, for example, that the educational software market would grow more than 70% per year and reach nearly $1 billion by 1987. That's not quite how it worked out.

> "WE HAD a new organization chart every day. That meant building the organization — and unbuilding it — having to shuffle people around, always dealing with people's egos, emotions and insecurities."
>
> PORTIA ISAACSON
> FUTURE COMPUTING

But mistakes or not, Future Computing in many ways led the PC industry by the hand into its maturity. Not only was Isaacson's timing perfect in offering the guidance the industry needed, but her own personality and charisma practically guaranteed that her venture would flourish.

"You've [probably] seen a speaker who, through whatever technique, holds the audience right here," she says. "And you've listened for two hours and thought it was 10 minutes." Dispensing with false modesty, as usual, Isaacson puts herself squarely in that category. "On a public forum, I'm a very powerful, dynamic, opinionated speaker," she claims, and few would deny it.

In the less public debates of business negotiations, too, Isaacson long ago figured out how to be irresistible. "I took a course called Persuasion by Hypnosis, which sounds real sensational," she says, "but it's not."

"The course was about controlling the group, in a way, and how to use what are called 'waking hypnosis techniques,' " she continues. "I had, in fact, used them and didn't know it before I took the course." Isaacson was even using them back in her Stratford, Okla., high school debates. "Even then I could hold an audience," she says.

Without these particular attributes in its founder — as well as Isaacson's already established relationships in the computer community — it's questionable whether Future Computing would have ever gotten off the ground. She was the company's prime attraction and major product from the first day.

With Isaacson at the helm, the company not only got off the ground but rocketed straight up. The micro industry's boom in the early '80s propelled Future Computing's own expansion, and within two years, it had gone from strictly consulting to a product-oriented company.

At its height, Future Computing had more than 300 clients paying $15,000 to $50,000 a year for its reports, newsletters and consulting services. Aside from IBM and Sears Roebuck and Co., Future Computing's clients have included Apple Computer, Inc., Digital Equipment Corp., AT&T, Xerox Corp., Eastman Kodak Co., Gillette Co., RCA Corp. and *Time* magazine.

Never the same

Any business that boosts its income more than 900% in its first two years has to move extremely fast. And Future Computing did.

"We had a new organization chart every day," Isaacson says, "and I spent probably most of my time — and definitely most of my emotional energy — on the people. That meant building the organization — and unbuilding it — having to shuffle people around, always dealing with people's egos, emotions and insecurities."

The company had to scramble in other ways, too. "Because we'd grown so fast with no outside funding, there was never a payday I knew I would make in the first three years of the company," she reveals. "But we made every one, and in fact, we never stretched our suppliers."

Future Computing's astounding growth brought changes not only in the company's functions but also in Isaacson's functions within the company. By the time her then-husband, Egil Juliussen, had been with Future Computing for a year, its rapid growth meant that someone had to assume responsibility for the firm's overall functioning.

"Egil had no desire to manage," Isaacson says, "so I had to and wanted to manage the company, while juggling the client work. I had to [make the] transition from being the company's primary product to being the general manager of the company." It turned out to be the hardest thing she had ever done.

"Being a general manager is a balancing act," she explains. "To any general manager report, in some way, product development, marketing, planning, finance, personnel, sales, building facilities, computer systems — everything about the company falls on [the general manager's] back ultimately.

"So if you've done a good job, you've tried to hire strong managers in all areas that report to you," she says, "but you never

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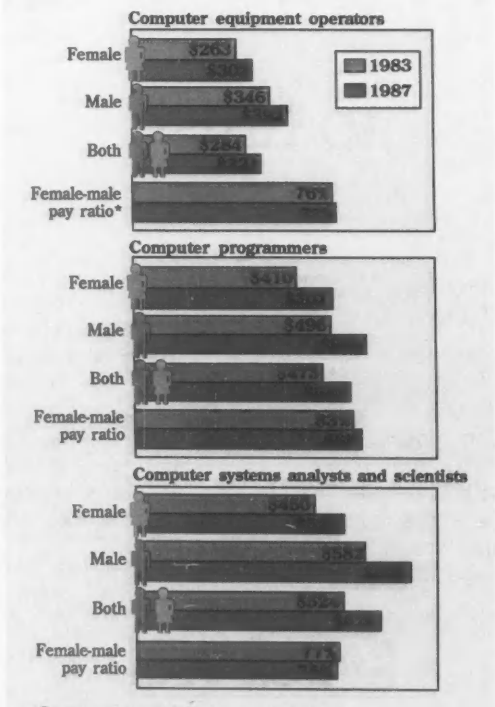
Median weekly wages for full-time employees in computer-related jobs show that women have not caught up yet



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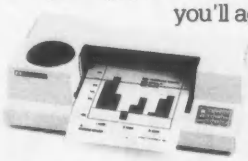

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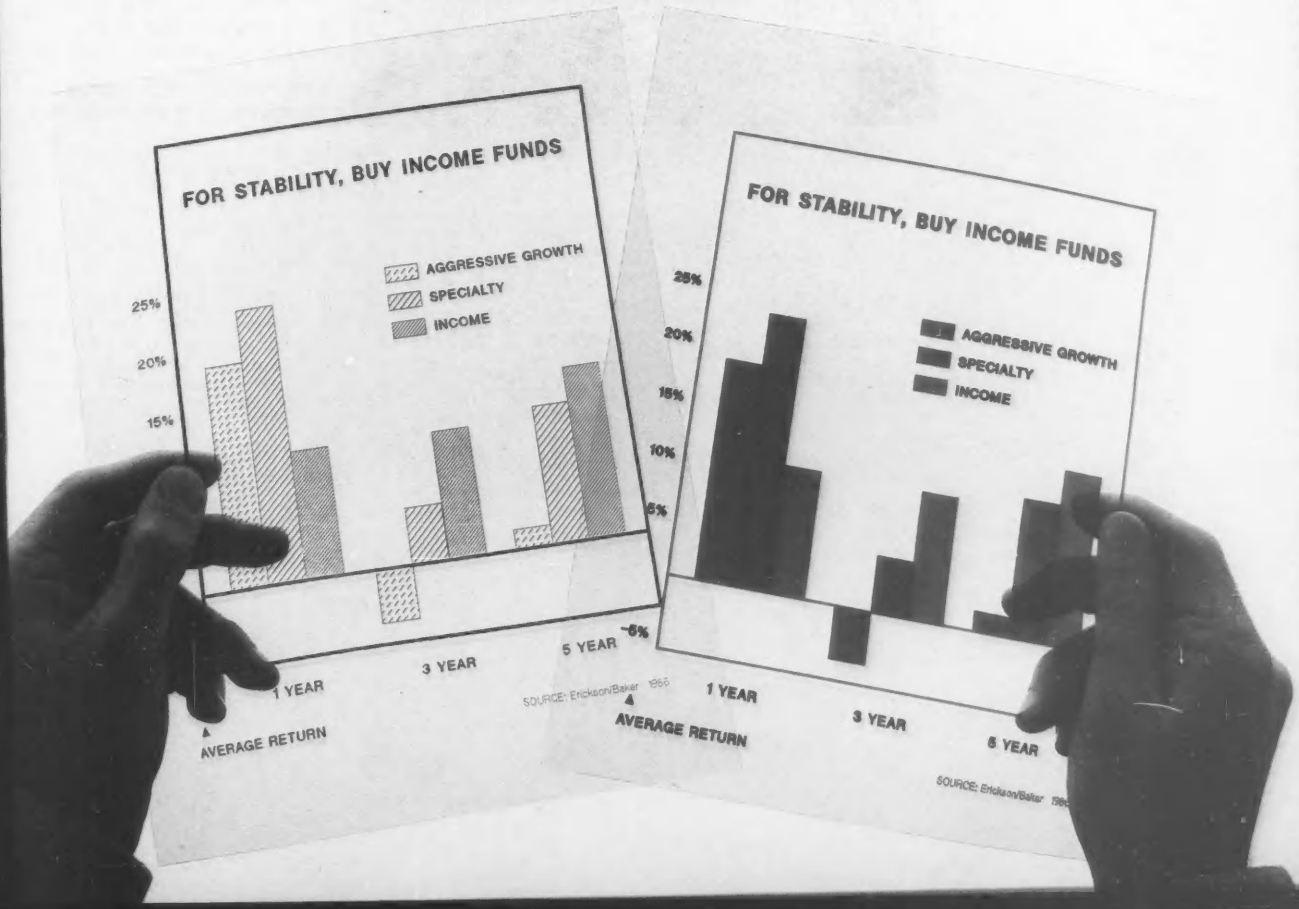

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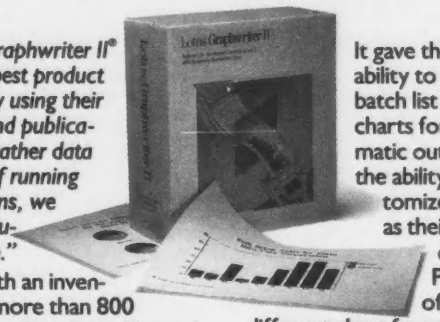

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"General managers who have come to feel success at their job have learned how to be happy with the balance: the fact that at the end of the day they picked the right 20 problems to handle, they handled them all in some way, and on the net, they got 'adequates,' " Isaacson says.

But Isaacson is not happy with the balance. She wants to be a superstar at all times. "I need to feel like I'm winning all the time, that I'm doing it well. When I started Future Computing, I was doing consulting, doing business strategies, analyzing and explaining the industry to people and so on, and I was really good at that and still am."

But as her role in the company evolved from consultant to general manager, so rose her level of stress, and the mental anguish took a physical toll. She started experiencing extreme pain in her back, which sent her to a chiropractor and a massage therapist. She also put on 40 pounds in three years.

"I've asked myself why Future Computing would affect me more adversely [in terms of stress] than all this other stuff I've been through. Future Computing is nothing compared with going to the grocery store with three babies all under 2 years old," she laughs.

Isaacson has concluded that the source of her stress is a feeling of lack of control. "People say, 'Gee, Portia, it must be really neat to have your own business,' and I say to them, 'I don't think you understand. This [expletive] business has me!' I mean 24 hours a day, seven days a week, this business has me," she says.

In late 1983, however, Isaacson started to see a glimmer at the end of that long, dark tunnel. Future Computing was approached by three potential buyers at about the same time. "If we had picked three companies we wanted to talk to, the three that came to us were the three," Isaacson says.

In July 1984, McGraw-Hill bought Future Computing from Isaacson and Juliussen for a reported $8 million in cash, plus additional payouts based on future profits. McGraw-Hill was a dream come true for Future Computing. "We took their first offer," Isaacson says. "It was just right."

Nevertheless, Isaacson was waving good-bye to the entrepreneurial Future Computing. "It's exactly like when a child goes off to college," she says. "It's something you want to happen — because for the company to mature, grow, exist forever, it needs to happen. At the same time, you are giving something up as it grows and matures. There are some feelings of 'Gee, I miss the kid.' "

.....

On family and career

One of the most compelling conflicts for the successful woman is the tug-of-war between her professional life and her personal life. There is always a trade-off when a woman with a family enters the business world.

"I did not really get to enjoy my children when they were young," Isaacson says. "Things were really bad — we didn't eat very well — so enjoying my kids was almost impossible."

Ironically, her only regret is that her kids don't remember their early years of poverty, from which she protected them so well. "In later life, I came to understand that it would have been very good for them to have been consciously through it with me," she says. "But you don't think that way in the beginning."

> "I NEED TO feel like I'm winning all the time."
>
> PORTIA ISAACSON
> FUTURE COMPUTING

Instead, they recall a seemingly endless supply of money. "I manage them like a business," Isaacson reveals. "I'm their authority figure, and that's derived from the fact that I'm the source of all funding. They have a weekly allowance, I pay all their bills, and if they do well in school, they get lavish vacations."

Isaacson seems to have been reincarnated several times over without ever having to die. She's had five marriages and five divorces. She's had several careers in academia and in business. For years, she admits, ambition blinded her to everything but her work, and consequently she lost everything but her work. Besides that, she usually married for all the wrong reasons.

"I am as driven to having a close personal relationship as I am, I think, anything else," she explains. "So if I don't have one, I'm actively looking. I don't know that that's all positive, by the way. It probably stems from insecurity of some type — of just wanting to have that relationship."

'It's no secret'

In sharp contrast is the enviable stability of Morby's experience. She has been married to Jeffrey Morby for more than 25 years. "It's amazing," she marvels. "We've been married since we got out of college, but we don't feel like we've been married that long." What's their secret? "It's no secret," she says. "It's luck and everything else. But the basic reason is we have a lot in common. We both love sports, travel, reading, movies and the theater."

Others wonder how Morby executes her balancing act between job and family so gracefully. "Our people spend 60% of their time on the road," TA Associates managing partner Kevin Landry told *Venture* magazine in July 1986. "I don't know how Jacqui does it. It's tough on all of us who are married."

But to Morby, it's not an issue. When asked whether the constant travel bothers her, she quickly replies, "Oh no, it's fun. If I stick around too long, I feel like I'm not getting anything done."

Unlike some whose very identities are wrapped up in their careers, Morby doesn't rely so much on TA Associates for her sense of self. That may be partly because she spent several years quite contentedly as a homemaker before entering the business world.

Her success in business has added a whole new dimension to her marriage, Morby says. "We've always been very close, but probably [my success] was a surprise to him — and to me. Who knows what one can really do?"

Lost time

Myers' dedication to Quarterdeck has paid off in business success, but it robbed her of crucial years of personal time. "You miss opportunities to meet somebody," she says, "but the choices that were there weren't more attractive than the work."

Whoever the choices were, they would have had to be awfully patient to put up with the kind of schedule Myers kept. "No one who worked all those hours was married," she says. "None of us could have had families then, in terms of hours. I had no personal life and would just see friends occasionally."

Having paid such a potentially high price for success, does Myers regret it? "No," she says. "To feel comfortable as a person, the last several years have been very valuable." •

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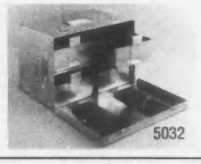
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Anthony Reed

Resignation season

This is the beginning of data processing resignation season. It is easily recognizable by the number of programmers using their company's word processors and copiers to mass produce resumes at 2 a.m.

If they're lucky, they'll land a job offer and then prepare their resignation. Some will prepare a one-liner such as, "This is to inform you of my resignation effective . . ." Others will prepare a three-page salute or a tongue-lashing about the managers and company before the "I quit" sentence.

It really doesn't matter how the letter is written. Most companies will respond in one of three ways: "The sudden death," "The DP death march" or "The squeeze play" method.

Sudden death

As its name implies, the sudden death response is quick and supposedly painless. It involves walking the employee out of the company within hours after he has submitted his resignation. This supposedly prevents him from breaching the computer's security. However, if he wanted to do this, he would have done so when he found out about the job offer — not when he submitted the resignation.

It's not uncommon for an employee to start removing company property, such as technical manuals, reference cards and copies of programs, before he resigns. Many managers have discovered empty

Continued on page 81

Awards recognize importance of MIS

BY JAMES CONNOLLY
CW STAFF

Strategic use of information and partnerships between MIS and business units are capturing the attention of corporate America and, as a result, appear to be spawning professional awards for recognition of success in those areas.

Two groups recently opened nominations for their second year of information technology awards with eyes toward honoring managers and organizations that make strategic use of information technology, particularly through partnerships or while overcoming tough obstacles.

"The feeling was that there really wasn't an award that could really highlight achievements in this area," said Charles H. Kriebel, a professor at the Carnegie-Mellon University Graduate School of Industrial Administration.

Carnegie-Mellon and American Management Systems, Inc. (AMS) recently opened nominations for their cosponsored Second Annual Awards for Achievement in Managing Information Technology. Those awards, five of which were given last year, will be presented in November and are open for nominations until May 1.

"What we were primarily looking for wasn't just that the information was being used in a strategic manner or in an innovative way, but also that the individual faced some obstacles," Kriebel said. He said the 1987 winners overcame barriers such as budget problems, bureaucracy and tight deadlines while implementing systems that helped their organizations, whether they were corporations or government agencies, to gain information advantages.

Limelight for all

Although Carnegie-Mellon, in Pittsburgh, and AMS, a Washington, D.C.-area consulting and software firm, are orienting their efforts toward individuals who carry out information technology strategies, the Chicago-based Society for Information Management (SIM) is looking first at the parent organization and second at the individuals.

"This is not so much a person being honored — it is a partnership — and, if you think about it, it is the company itself that is being honored because it makes that partnership possible," said Henry S. Givray, the executive director of SIM.

"The kind of relationship we are looking for is not only in the way these people are able to identify opportunities but in the

Continued on page 80

Data View

Stress tests

Most frequently cited sources of on-the-job stress, according to 344 managers surveyed

INFORMATION PROVIDED BY THE ADMINISTRATIVE MANAGEMENT SOCIETY
CW CHART: FRANK C. O'CONNELL

Focused on success

Kodak's Hudson strives to create MIS harmony

BY KATHY CHIN LEONG
CW STAFF

Everyone remembers when, three years ago, the U.S. District Court in Boston upheld Polaroid Corp.'s patent infringement charges against Eastman Kodak Co., forcing Kodak to stop manufacturing and selling instant cameras.

Katherine Hudson remembers it well. As then-general manager of the division, she handled the thankless task of shutting down the instant products group, redeploying 1,200 employees within Kodak and offering trade-ins for the 16 million Kodak instant cameras already in customers' hands.

"We had just 90 days to exit the business, and we did it on time," she recalls. It was a management challenge that prepared her for her January promotion to corporate vice-president and director of corporate systems.

Coincidentally, Hudson is the first female corporate vice-president the company has ever had. So is it a big deal? "I guess it is to my mom," remarks the 41-year-old Rochester, N.Y., native. "I guess the best thing about it is that no one here makes it a big deal, because the selection was based on the best person to fit the job. It happened to be me."

The position is as new for Kodak as it is for Hudson. Prior to her appointment, no such title existed. MIS executives were scattered throughout the decentralized subsidiaries, each running systems that were incompatible with other divisions'.

Hudson's charter is not an easy one. Kay Whitmore, the president of Kodak says, "We knew it would be an immense challenge to create a corporate environment for systems to meet the needs of Kodak for the future, as opposed to adjusting to the problems of the past."

Kodak, a $13.3 billion conglomerate, has an array of businesses and products. With each division setting its own course for surefire success, Hudson must sculpt a broad enough plan so that systems and networks forge ahead uniformly.

Computer room roots

Her systems experience is broad, ranging from her initial job as a systems programmer, in which she had to create her own mainframe forecasting applications and financial models. She managed groups in Kodak's business imaging systems area and became more familiar with computer systems, Kodak's storage products and the role of information technology in the market.

Continued on page 80

PROFILE
Katherine Hudson

Position: *Corporate vice-president and director of corporate systems, Eastman Kodak Co.*
Mission: *To sculpt a broad enough plan so that systems and networks forge ahead uniformly within each division.*

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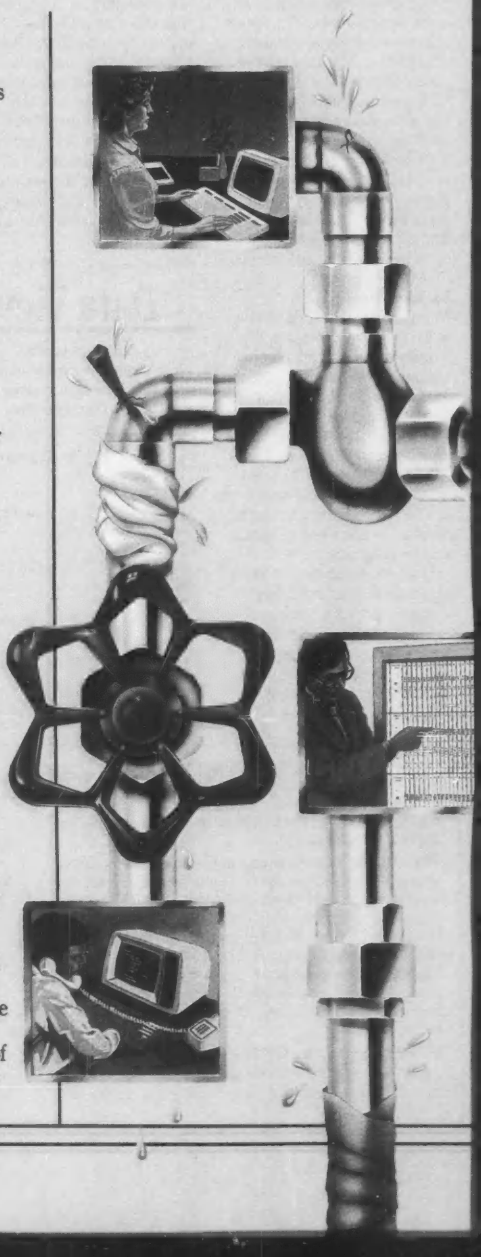

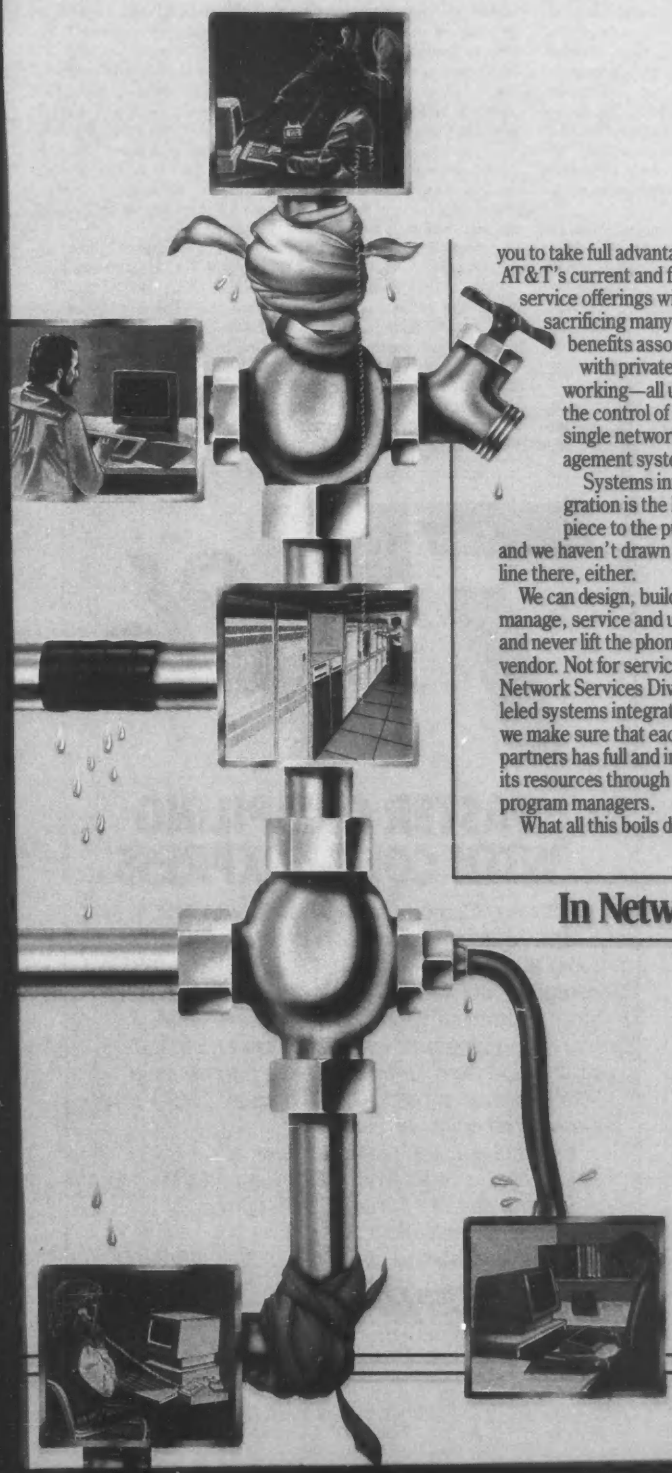

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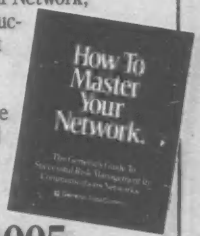

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Focused

FROM PAGE 77

"I can see clearly that you have to marry the information systems stategy to the business strategy," Hudson says.

Remarks one staff member in the MIS department, "It's going to be a tough job; all the business units are used to going their own way."

Dual careers

While building an organization, Hudson is also juggling the joys of building a family. As a first-time mother of a 6-month-old child, she's been adjusting to late-night feedings and has on many occasions rocked the child on one knee while working out of an open briefcase on the other.

If she were to write a book, Hudson says, she would would title it: *How to Survive on High Energy.*

"I am definitely a morning person," she says, "but recently, I am learning that I have to be a more flexible one as well."

According to Whitmore, Hudson was exactly the right choice for the job. "In establishing this new corporate office, we were looking for someone who had broad business experience; an individual who also has the dynamics and energy to be an agent of change," he says.

IF SHE WERE to write a book, Hudson says, she would would title it: *How to Survive on High Energy.*

Today, Hudson must define the boundaries of her job as she goes along. "Right now, I am paddling around listening to people's views — the employees', vendors' and consultants'. If our actions are not servicing customers, then we know we have done something wrong."

Hudson is anxious to deliver more helpful information services to the subsidiaries. "But first, we have to understand where we are," she says. "The second priority is to determine where the company wants to go. Third, we have have to move ahead."

By the end of this year, "we hope to have a solid, shared vision with alternative strategies for the future," she says with determination.

Something that will help Hudson accomplish her goals is the fact that she is well liked by her co-workers.

"She's a combination of brains and personality," one of her employees says. "Kathy is one of those people who loves life and is very innovative."

Hudson says she often discusses business with her husband, who is also an executive at Kodak.

It's academic

Although Kodak is the only company at which she has ever worked, that move was unintentional. Years ago, Hudson dreamed of becoming a university professor of economics. Hence, after finishing her bachelor's degree in business management at Indiana University, she rushed off to Cornell University to secure a master's degree in economics.

While all the pieces seemed to fall neatly in place, what didn't cooperate was the campus political climate, as the Vietnam War gave rise to student riots. Hudson decided to put a collegiate career on hold until the situation improved and went to Kodak as a systems analyst.

Expecting to stay a year, Hudson says she was so impressed with the company that she has remained for 18.

Hudson's view of management is simple: Set a strategic direction, get the right people for the right job and give the people the right tools. "Then my time can be spent communicating with people and working on the fun stuff," she says.

Civic duties

Hudson demonstrates her commitment to people both on and off the job. Last year, she was the chairman of the 75th anniversary celebration of the Girl Scouts, and she is now vice-president of the local Boy Scout Explorers council. "I'm concerned with young people, because they need the opportunity to explore different careers," she says. "I like to be there to make that happen."

In her years at Kodak, Hudson has been fortunate enough to have had many mentors along the way. She says she wouldn't be surprised if she retired from the company.

"At my retirement party, I would like to be remembered with people telling me things like: 'Do you remember when you helped me with this?' or even 'Kathy Hudson was there, and after that time, I was able to go forward and pursue my goals.' That would be nice."

Awards

FROM PAGE 77

way they are able to communicate those opportunities and then make them happen," Givray said, noting that the two partnerships that won SIM's 1987 Partners in Leadership award were made up of MIS and general business people who united to achieve information-related benefits for their companies, such as new products and better services for users.

Winners in both competitions will receive customized sculptures. Carnegie-Mellon and AMS also provide honorariums.

The 1987 winners of the SIM award were Sara Lee Corp.'s Consumer Products Group executives Paul Fulton and John Owens and Du Pont Co.'s Medical Products Department executives Robert Ridout and J. Stark Thompson.

The five winners of the Carnegie-Mellon/AMS awards were Michael P. Cruskie of the New York State Division of Criminal Justice Services, Joseph T. Brophy of The Travelers Corp., C. Clinton Joyce of Albertson's, Inc. supermarkets, Ron J. Ponder of Federal Express Corp. and Michael R. Zucchini of General Re Corp.

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Reed

FROM PAGE 77

binders that once contained technical manuals after an employee has left.

Using "quick and dirty" programming methods and violating standards isn't unusual for the departing employee, either — he won't be around to clean up the mess.

The sudden death method also lowers the morale of the other programmers. They begin to view the managers and the company as being insensitive. They begin to wonder whether it's worth giving 110% when they'll be treated like a shoplifter caught in a department store when they resign. Watching a co-worker pack his belongings under the watchful eye of a security guard and a manager is a sight employees don't easily forget.

The DP death march

The DP death march is the reverse of the previous method. The employee works until the effective date on his resignation. Each day on the old job seems like a Monday — it just drags on and on.

This response poses a different set of problems. While morale isn't affected as much, productivity goes down as numerous well wishers stop by to visit the employee before his departure.

At worst, the employee might show up to work and do nothing or take advantage of his sick days. After all, he will be leaving in two weeks and feels that he's worked enough overtime to deserve the rest. If he's well respected by his peers but disliked by management, this can lead to lower productivity and morale as the employee becomes more vocal about his complaints. At this point, the sudden death response becomes an acceptable solution.

The squeeze play

The squeeze play response is a combination of the earlier two. The employee stays until he schedules his exit interview. It can be that afternoon or two weeks later. Either way, he gets paid up to the effective date of his resignation or one or two weeks, whichever is earlier.

If documentation is written before, instead of after, production changes are implemented, the resignation will have minimal impact. A smart employee will say his good-byes and leave within two or three days for a short vacation rather than sticking around.

This tactic has the advantages and disadvantages of the previous methods. The person leaves with "respect" and productivity is only briefly interrupted. However, there still may be breaches in security.

These methods leave the company in a vulnerable position, particularly if it does not have standards in place to guard against employee theft or to continuously monitor quality and productivity.

Companies should conduct source code reviews of all production changes. However, when this isn't possible, it should review the changes implemented by the former programmer over the previous one or two months.

So — if you find that your company experiences high turnover, consider establishing a formal, post-resignation review policy and adopt the squeeze play response.

Reed is director of business systems for a Dallas-area institution.

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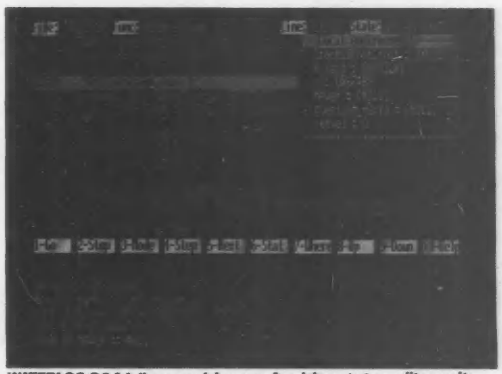

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APRIL 3-9

AUUA, Inc. (Unisys users) Spring Conference. San Diego, April 5-8 — Contact: Randal L. Leonard, Gay & Taylor, Inc., P.O. Box 1410, Winston-Salem, N.C. 27102.

PIMA Management Information Systems Conference. Savannah, Ga., April 6-8 — Contact: Scott Baumruck, Paper Industry Management Association, 2400 E. Oakton St., Arlington Heights, Ill. 60005.

APRIL 10-16

1988 EFTA Expo. Washington, D.C., April 10-13 — Contact: Jim Callan, Electronic Funds Transfer Association, Suite 1000, 1726 M St. N.W., Washington, D.C. 20036.

22nd Annual ATA National Workshop and Computer Systems Demonstrations. Baltimore, April 10-13 — Contact: American Trucking Association Management Systems Department, 2200 Mill Road, Alexandria, Va. 22314.

8th IC&C Executive Forum. Washington D.C., April 10-13 — Contact: International Computers & Communications, P.O. Box 17392, Washington, D.C. 20041.

18th Conference on Computer Audit, Control and Security. Atlanta, April 10-15 — Contact: Program Chairman, EDP Auditors Foundation, P.O. Box 88180, Carol Stream, Ill. 60188.

Atre Forum on Relational Data Base & CASE. Washington, D.C., April 11-13 — Contact: Nancy Carafa, Forum Registrar, Atre International Consultants, Inc., P.O. Box 727, Rye, N.Y. 10580.

Facsimile & Image Communications Conference. Boston, April 11-13 — Contact: Cap International, Inc., One Snow Road, Marshfield, Mass. 02050.

Second Annual Logistics Conference and Technical Exhibit. Dallas, April 11-14 — Contact: American Production and Inventory Control Society, 500 W. Annandale Road, Falls Church, Va. 22046.

1988 AIIM Show. Chicago, April 11-14 — Contact: Association for Information and Image Management, Suite 1100, 1100 Wayne Ave., Silver Spring, Md. 20910.

The Relational Institute DB2 Product Fair. San Jose, Calif., April 11-15 — Contact: The Relational Institute, Suite 106, 6489 Camden Ave., San Jose, Calif. 95120.

Spring 1988 National Symposia and Workshops. Washington, D.C., April 11-22 — Contact: The National Institute for Software Quality and Productivity, P.O. Box 70555, Washington, D.C. 20088

Data 88 With Telecom. Stockholm, Sweden, April 11 — Contact: MMS Datamassor AB, Box 4113, S-181 04 Lidingo, Sweden.

International Programmable Controllers Conference. Detroit, April 12-14 — Contact: Michelle Marzahl, Engineering Society of Detroit, 100 Farnsworth, Detroit, Mich. 48202.

AM88, The Automated Manufacturing Exhibition and Conference. Greenville, S.C., April 12-14 — Contact: State Board for Technical & Comprehensive Education, Special Events Management, 11 Executive Center Drive, Columbia, S.C. 29210.

Cost Containment: The 1988 Imperative. Washington D.C., April 13 — Contact: Corey Green, The Yankee Group, 200 Portland St., Boston, Mass. 02114.

The Information Edge. New York, April 13-14 — Contact: Conference Registrar, The Conference Board, Inc., 845 Third Ave., New York, N.Y. 10022.

APRIL 17-23

Association for Systems Management Annual Systems Conference. San Diego, April 17-20, — Contact ASM, 24787 Bagley Road, Cleveland, Ohio. 44138.

Info Canada '88. Toronto, April 18-19 — Contact: Data Processing Management Association, P.O. Box 1004, Postal Station F, Toronto, Ont., Canada M4Y 2L4.

Eastern Simulation Conference. Orlando, April 18-21 — Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117

ISDN/88. St Louis, April 18-22 — Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

Advanced Manufacturing Systems Exposition and Conference (AMS '88). Chicago, April 19-21 — Contact: Cahners Exposition Group, P.O. Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

Corporate Electronic Publishing Systems (CEPS) Show and Conference. Chicago, April 19-21 — Contact: Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

Third Annual BMC Software User Group Meeting. Houston, April 19-22 — Contact: Marianne Levandoski, AT&T, Room 51A40, 30 Knightsbridge Road, Piscataway, N.J. 08854.

ANSI X12 EDI '88 Seminar & Technical Exhibit. San Francisco, April 20-21. Contact: Data Interchange Standards Association, Meetings Dept., Suite 355, 1800 Diagonol Road, Alexandria, Va. 22314.

ID Expo — The Third Annual Conference and Exposition of Automatic Identification and Keyless Data Entry. Boston, April 20-22 — Contact: Anthony Scalisi, Show Manager, Expocon Management Associates, Inc., 3695 Post Road, Southport, Conn. 06490

Computer Dealers and Lessors Association Spring Meeting. Palm Desert, Calif., April 20-23 — Contact: CDLA, 1212 Potomac St. N.W., Washington, D.C. 20007.

Information Industry Association Spring Conference & Exhibition. New York, April 18-20 — Contact: Information Industry Association, Suite 800, 555 New Jersey Ave. NW, Washington, D.C. 20001.

The DB2 Tools Symposium. New York, April 18-20 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

TEXPO '88. Anaheim, Calif., April 20-22 — Contact: Pacific Bell, Room 615, 140 New Montgomery St., San Francisco, Calif. 94105.

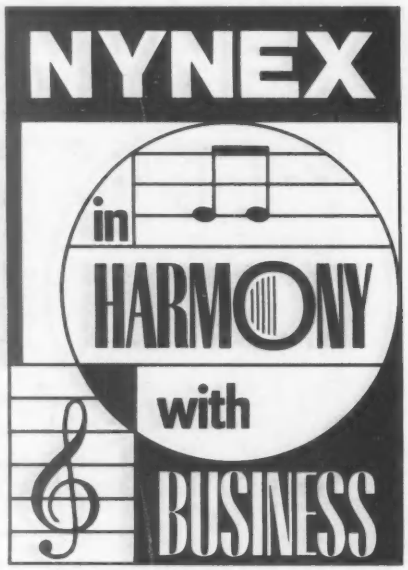
Technology Opportunity Conference, Optical Storage for Small Systems. San Francisco, April 20-21 — Contact: Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco, Calif., 94116

APRIL 24-30

Nucon:88. Nashville, Tenn., April 24-27 — Contact: Federation of NCR User Groups, Mail Station USG-2, Dayton, Ohio 45479.

Ingres Users Association Spring 1988 Conference. San Diego, April 24-27 — Contact: Paula Adams, Program Committee Chairperson, Effective Systems, Inc., Suite 1-2, 2601 Wyoming Blvd, N.E., Albuquerque, N.M. 87112.

Computer-Based Training Conference & Exposition. Washington, D.C, April 24-27 — Contact: Julia Stasio, Registrar, Computer-Based Training Conference, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.



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   - 31. Dir., Mgr., Suprv., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 36. Data Comm. Network/Systems Mgt.
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   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
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INDUSTRY INSIGHT

Jean S. Bozman

IBM's tough dance lessons

In the early 1980s, IBM watchers liked to say the IBM elephant had learned to tap dance. Indeed it had, with the addition of independent business units — such as the operation to speed the development of the Personal Computer.

Times have changed, and now that there is competition in the scientific and engineering market, the elephant is learning some new steps. IBM will continue to offer its standard mainframe solutions and to build on the standards of its MVS, VM and OS/2 operating systems, but each product will be marketed with a scientific twist for customers who require scientific capability. This change in the product line is a true business opportunity for expansion — if IBM plays its cards right.

IBM recognizes that the large corporations that use its mainframes to run their businesses have often turned away from IBM for scientific solutions. Examples abound in the petrochemical, consumer-goods manufacturing and aerospace industries.

The science shuffle

Scientific computing is back on the front burner, largely as a response to the demands of such large customers for a single, cohesive computing platform. But it is also there because in bid after bid, the federal government has stubbornly required Unix to ensure compatibility between systems made by different vendors.

IBM responded in a big way this month with a new version of Unix for the mainframe, AIX, that is completely compatible with AIX running on the IBM PC and on mid-range machines like the firm's 9370. Significantly, the AIX standard displaced the resource-hungry IX/370, IBM's first Unix offering for its mainframes.

"That's a real comfort factor for the true-Blue people," says Stephen Josselyn, program manager at Framingham, Mass.-based International Data

Continued on page 86

Are Apple and Lotus unfair?

Pros and cons of copyright laws dominate discussion at ADAPSO

BY CLINTON WILDER
CW STAFF

PALM DESERT, Calif. — The most potentially explosive lawsuit in software industry history brought almost universal criticism from industry executives and analysts gathered at the ADAPSO spring management conference here last week.

With the filing of Apple Computer, Inc.'s copyright infringement suit against Microsoft Corp. and Hewlett-Packard Co. just three days before the conference opened, the topic became a major theme of several sessions and discussions. In a staged debate on software protection, even the panelists who defended the concept of legal "look-and-feel" protection were critical of Apple's litigious tactics.

"Companies should not be seeking to gain a monopoly through the use of copyright law," said Harry Reinstein, president of Aion Corp., a Palo Alto, Calif.-based developer of expert systems tools. "That creates an unfair advantage."

"I do believe in protection; what people create should benefit them," said Esther Dyson, editor of the "Release 1.0" newsletter. "But I don't believe in robber barons. The best remedy is to license the technology. IBM, for example, should protect the PS/2 but license it. Then they have an advantage, but not an unfair advantage."

The IBM-bashing of other ADAPSO conferences in the past 18 months was noticeably absent. But IBM's leading adversary on the source code issue, Martin Goetz, applied a favorite Big Blue criticism to Apple and Lotus Development Corp., which has sued Paperback Software and Mosaic Software Corp. on the look-and-feel issue.

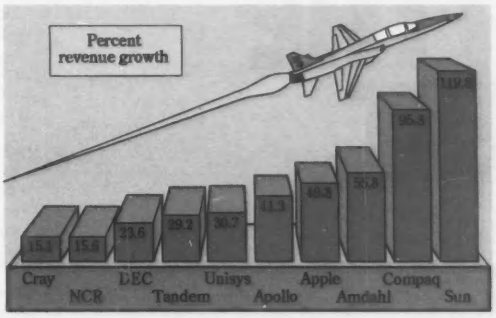
"Existing copyright law was never intended to protect look and feel or user interfaces," said Goetz, the Applied Data Research, Inc. co-founder who is now at Syllogy Corp. "Lotus and Apple are using FUD — fear,

Continued on page 86

Data View

High-tech high flyers

Top 10 revenue gainers among major hardware vendors, 1987



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Intel witness recants story

BY KATHY CHIN LEONG
CW STAFF

SAN JOSE, Calif. — Dr. David Patterson, an Intel-hired expert witness involved in the NEC Corp. vs. Intel Corp. copy infringement lawsuit, last week reversed his testimony, saying that a portion of the original NEC microcode is not similar to Intel microcode. The change of heart scored a point in favor of NEC.

At a hearing in federal court here, attorneys said that after Patterson had examined the

Continued on page 84

Chip firms thrive after setback

BY JAMES DALY
CW STAFF

The inventory purge that has sent the semiconductor industry reeling during the past three years has eased, allowing chip makers National Semiconductor Corp. and Micron Technology, Inc. to post vastly improved quarterly net income and revenue results.

Micron also received a further boost last week when it signed on Intel Corp. to market its dynamic random-access memory chips.

The prospects for U.S. dynamic RAM chip makers were nearly dead just three years ago, after the Japanese had flooded the market with cheap memory chips and sent many firms, including Intel, scurrying.

But since the Reagan administration clamped a lid on Japanese memory chip imports last year, the U.S. market has prospered.

Other firms joining the first trickle of quarterly fiscal reports included 3Com Corp. — which posted quarterly gains behind industry confidence in its pair-up with Microsoft Corp. and its merger with Bridge Communications, Inc. last year — as well as On-Line Software International, Inc., which had a strong quarter.

Breakdowns of the financials

Continued on page 90

Entrepreneurs' start was Touch and grow

BY KATHY CHIN LEONG
CW STAFF

SCOTTS VALLEY, Calif. — While trying to woo people into working for Touch Communications, Inc., founders Brian McGann and Dennis Morrison used a highly unorthodox approach.

They offered no guarantees of profit sharing, bonuses or jaw-dropping salaries. In short, they offered no guarantees — period.

And people still came to them.

"All we could offer was our trust," McGann recalled, viewing the mountains from his window office. "We started with a lot of good intentions and a lot of powerful people."

That start was exactly three years ago, in March 1985, when McGann and Morrison penciled out their business plan in McGann's kitchen. The dream was to offer applications software supporting the ISO's Open Systems Interconnect (OSI) communications standard, an evolving architecture that will someday allow users to link dissimilar machines together in one network.

McGann came up with the company name because it was human-oriented, he recalled. "Anyway, high-tech names are shallow," he said.

The OSI market is getting off the ground with only a few specialty companies, such as Retix in Santa Monica, Calif. Analysts said they believe Touch Communications is well positioned to catch interested users, because the company focuses on providing OSI software that works with existing applications.

"Touch is obviously a pioneer in what it is doing," observed Nina Burns, senior analyst at Infonetics, Inc., a Santa Clara, Calif., network research firm.

"There is no question that networking in large companies is a big need," said Touch President Bill Fello, formerly president of Xerox Computer Ser-

Continued on page 90

Up & Coming: *Touch Communications*

Location: Scotts Valley, Calif.
Year founded: 1985
Co-founders: Brian McGann and Dennis Morrison
Employees: Fewer than 100
Product line: OSI software for VAXs, Macintoshes, IBM PCs and other machines
Of note: First OSI software company that targets end-user accounts.

Intel

CONTINUED FROM PAGE 83

NEC Clean Room Microcode Reset sequence, he decided that the Reset sequence in the original NEC microcode compared with the Intel microcode does not show "substantial similarity," a claim that must be proved in copyright infringement cases.

"Of course, this bit of testimony is good for us, but now I also question the merit of the witness," said Linnet Harlan, a NEC attorney. "This causes me to question his approach to the entire analysis of the case."

When questioned about the case, Intel spokeswoman Jacki Jarvey would not discuss the ligitation in detail but stressed, "The witness reversed his testimony on only one of 54 sequences that are in dispute."

NEC initially sued Intel in December 1984, hoping to have Intel's copyrights over microcode overturned. Microcode is a set of embedded instructions that tells the microprocessor how to respond to certain electronic signals. NEC stood firm on its position that similarities in microcode are impossible to avoid.

However, in February 1985, Intel filed a countersuit alleging copyright infringement. It was because of Patterson's original testimony that Intel charged that NEC's code was a violation of the Intel microcode copyright.

Harlan said in a prepared statement, "It appears that Patterson's change in testimony was required in order to follow Intel's party line."

Defending NEC's belief that all microcode is somewhat similar in nature and should not be copyrighted, Harlan said that the two NEC microcodes are very similar . The Clean Room Microcode was developed by NEC, without access to Intel microcode, to prove that microcode similarities are inevitable.

"Intel wanted to take the position that the Clean Room Microcode is different from the Intel microcode while simultaneously arguing that the original NEC microcode is substantially similar to the Intel microcode," Harlan said .

The trial for the case has been set for June.

INDUSTRY WEEK IN BRIEF

NBI, Inc. President and Chief Executive Officer Thomas Kavanagh has sent a polite but firm "thanks, but no thanks" letter to **Capital Associates, Inc.** President Richard Kazan after Kazan indicated recently that his Colorado Springs-based firm is interested in acquiring Boulder, Colo.-based NBI for $7 per share, or roughly $65 million. NBI said, however, that other bids will be considered.

Professional services vendor **Computer Task Group, Inc.** (CTG) has completed the $10.5 million acquisition of **Scientific Systems Services, Inc.**, a Melbourne, Fla.-based computer services firm specializing in software systems for the manufacturing process control and power industries. Buffalo, N.Y.-based CTG is one of the largest providers of computer services, with annual revenue of $170 million and 60 branch offices.

The federal government health care field has become fertile ground for **Digital Equipment Corp.** The Maynard., Mass.-based firm will supply clustered VAX 8500 and Microvax 3000 series computers to 104 Veterans Administration hospitals and medical centers under the terms of a $100 million contract recently awarded by the VA. The award came one week after DEC was named a $400 million subcontractor in a $1 billion health care information system awarded by the Department of Defense.

AT&T has agreed to purchase all the stock of **Tridom Corp.**, a Marietta, Ga.-based designer and manufacturer of data communications equipment used in satellite-based networks. Following approval by the Federal Communications Commission, AT&T will acquire Tridom's shared-use earth station in Marietta and all proprietary software rights and related network management and control capability.

Print system manufacturer **QMS, Inc.** plans to acquire and fold **Imagen Corp.**, a Santa Clara, Calif., image-processing system maker, into a newly created and wholly owned subsidiary of QMS in exchange for approximately 1.85 million shares of Mobile, Ala.-based QMS's common stock, worth more than $22 million.

An Wang, the founder, chairman and chief executive officer of Wang Laboratories, Inc., has been inducted into the **National Inventors Hall of Fame** for his 1948 invention of the pulse-transfer controlling devices that enabled the use of magnetic core memories in computers, which in turn led to more powerful and compact machines. The Arlington, Va.-based Hall of Fame includes 68 inventors of the 19th and 20th centuries.

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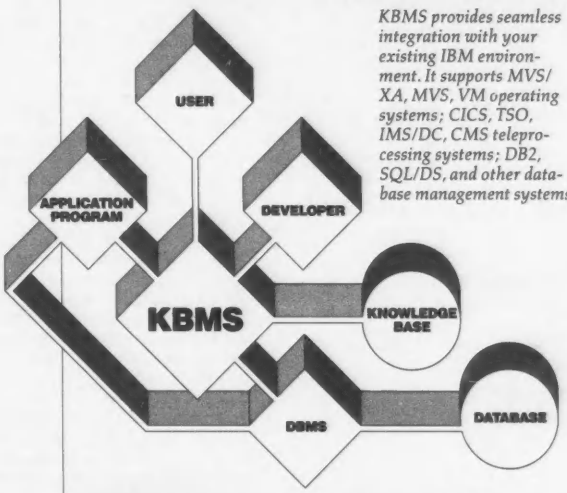

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ADAPSO

CONTINUED FROM PAGE 83

uncertainty and doubt — to beat their competitors."

The conference attracted a high number of microcomputer software panelists and attendees, most of whom said Apple has done nothing to help either the industry or its own image. "I have yet to come across a single vendor or user who thinks this suit will benefit anyone, including Apple," said Rob Shostak, chief scientist at Scotts Valley, Calif.-based Borland International.

Claris Corp. President William Campbell, formerly Apple's top marketing executive, did not comment directly on the suit but noted that it is "absolutely consistent" with Apple's track record of legally protecting its technology. He cited Apple's successful 1983 infringement suit against Apple II clone maker Franklin Computer Corp. and its fight against illegal Macintosh II imports and mail-order house trade practices.

Other ADAPSO conference highlights included the following:

• Focus Research Systems, Inc. released a study dramatically illustrating the IBM 9370's slow start in the U.S. and Canada. The study, which showed the 9370 being used primarily as an MIS- rather than department-based CPU [CW, March 7], also found that only 44% of intended 9370 purchases were actually installed in the past year.

Focus President Thomas Niehaus contrasted that number with his firm's typical fulfillment rate of 85% for intended CPU purchases. "The 9370 numbers are more typical of emerging technologies," he said.

But J. Fritz Skeen, IBM's director of mid-range systems marketing, said that in the worldwide marketplace, IBM has met the forecasts it projected when the 9370 was introduced.

• There will not be any rekindled 1987 rumors of a merger between Oracle Corp. and Ashton-Tate Corp. by anyone who watched the verbal sparring by their respective chairmen, Lawrence Ellison and Edward Esber. The two clashed heatedly over their different philosophies on distributed data base architecture.

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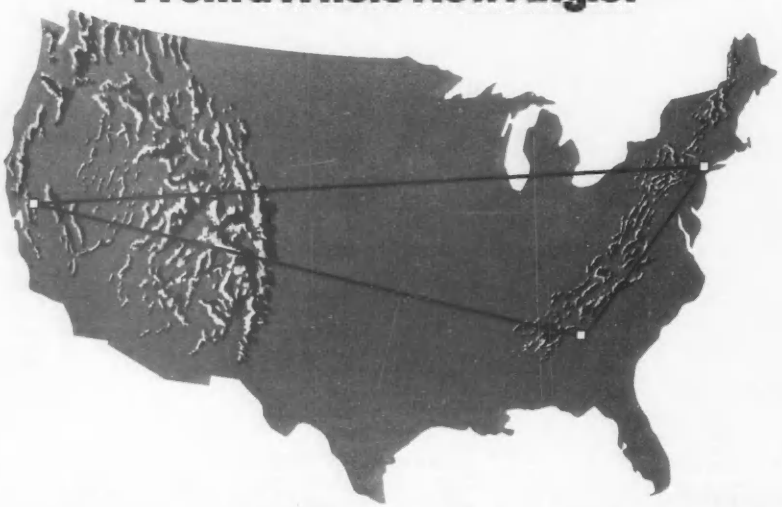

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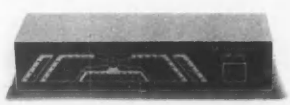

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Bozman

CONTINUED FROM PAGE 83

Corp.'s systems and peripherals service. IBM's move to better meet special user needs was assisted by the company's recent reorganization, Josselyn says.

But just as it is opening the door to scientific computing, IBM is also making itself vulnerable to competition outside the proprietary world of Systems Network Architecture because the firm is designing within the scientific community's standards of Ethernet, Open Systems Interconnect, Unix and Transmission Control Protocol/Internet Protocol.

Even so, IBM's move toward scientific computing is clear. There is a drive toward greater graphical representation in IBM interfaces — something beyond what was developed in the computer-aided design and manufacturing arena for use with the AIX-driven RT PC. Icon-driven applications should, for the most part, come to replace menu-driven ones, say MIS executives who have been allowed to peek into IBM's laboratories.

Supers are back

Supercomputers are back on IBM's agenda, having been out of it since the cancellation of the Josephson-junction project in the early 1980s. Now IBM has turned to former Cray Research designer Steve Chen and to his small Wisconsin start-up, Supercomputer Systems, Inc., to build a supercomputer IBM can sell as its own. But a tangible supercomputer from this project is, by Chen's admission, four or five years away.

For all this change, there are still a few steps the elephant hasn't mastered. Missing, industry observers say, is an on-line transaction processor (OLTP) that is IBM's own. Such a processor is needed for real-time control of experiments and factory-floor operations. IBM is, instead, reselling a Stratus fault-tolerant computer as the IBM System/88. Yet executives from DEC, Unisys and Tandem have privately remarked that they are amazed IBM doesn't have a homegrown machine to compete in the fast-growing OLTP market.

Without its own OLTP machine or supercomputer, IBM will still have a short dance card when it goes looking for scientific and engineering customers. There are simply too many non-IBM choices available on the market — DEC VAXs, Convex minisupers, Cray supercomputers and CDC's ETA supercomputers among them. By contrast, a standard IBM 3090, even outfitted with VF, cannot equal a standard Cray.

That's why it is easier to find a 3090 with VF at an academic institution like Cornell University than it is at an oil company. In the past few months, IBM has asked prominent computer scientists to enhance VF's functions and has asked chemists and physicists to prepare programs optimized for the 3090 with VF. But these two-step solutions may not please everyone.

"IBM is going to have to realize that customers are going to want to go all the way," Josselyn says. "They're going to want to dedicate a computing resource to their scientific computing needs." And for most, that scientific solution hasn't been to go dancing with IBM alone.

Bozman is *Computerworld*'s Chicago-based Midwest correspondent.

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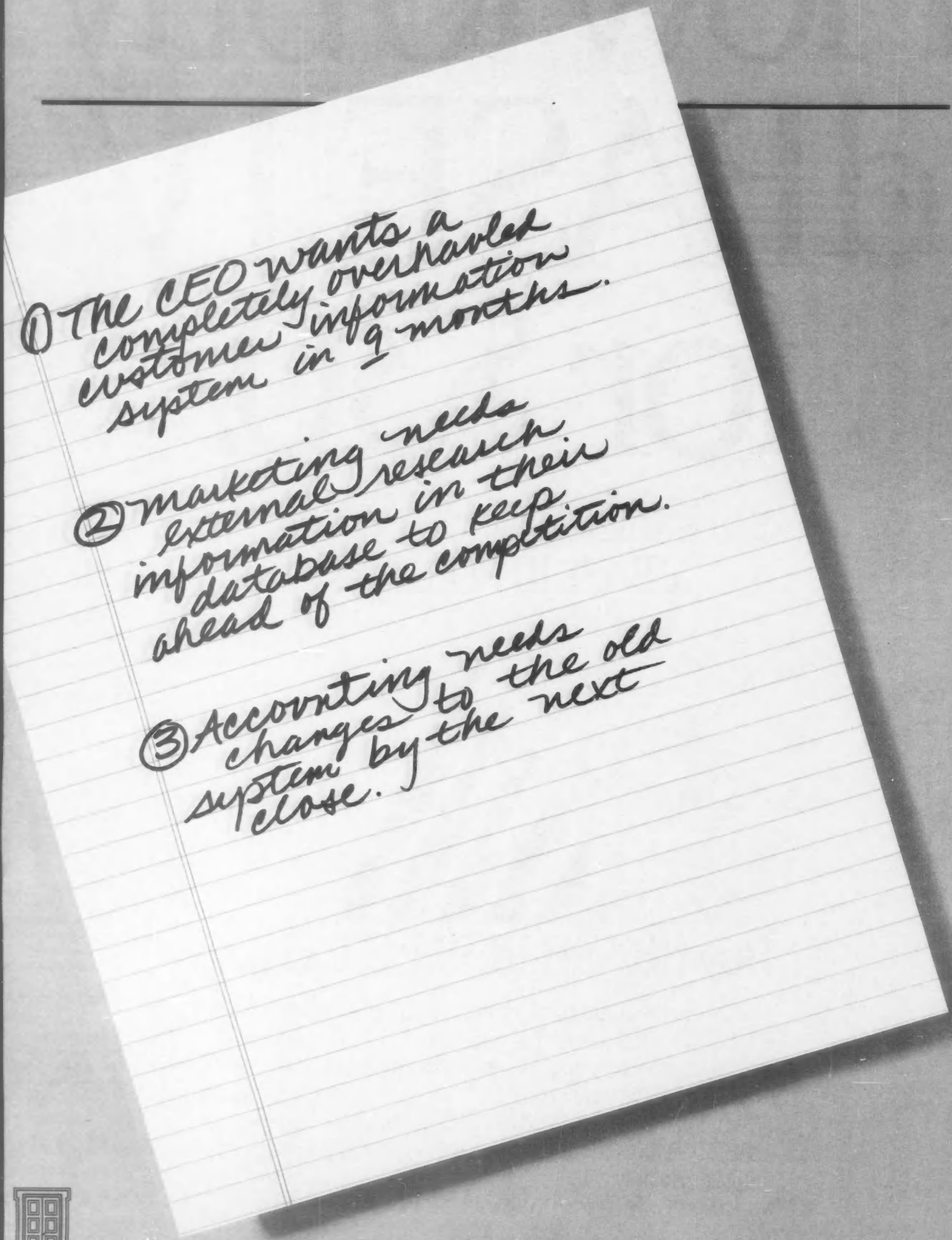
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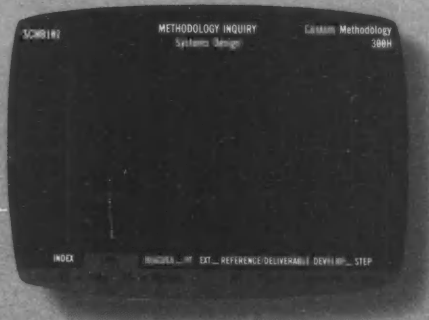

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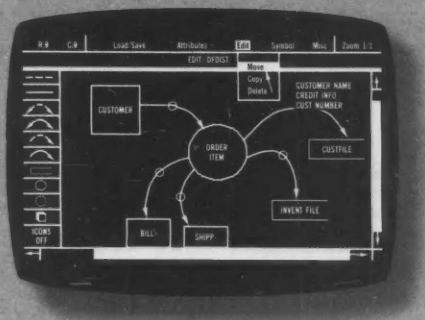

DESIGN/1 is a dictionary-based system for analysts and designers to develop data flow diagrams, paint screens and reports, plus facilitate data design and maintenance. To facilitate better system design, the prototyping facility encourages user participation.

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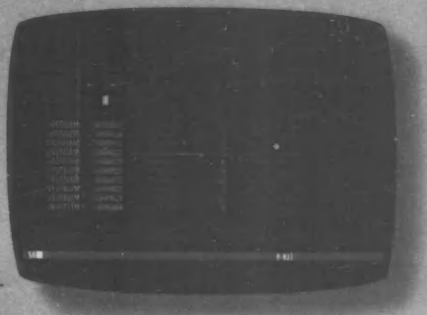

INSTALL/1 uses the design specifications from DESIGN/1 and generates a production COBOL program. It promotes standardization during the development process by generating everything necessary for an on-line application: records, screens, SQL, logic and copybooks. Configuration management and testing aids complete the system. When maintenance is required, changes are resolved throughout the system automatically.

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Touch

FROM PAGE 83

vices. "A standard approach is needed, and that is what OSI brings."

Since its inception, the company has passed some major milestones. In December, it shipped its initial product, Touch OSI, a software package that supports Microsoft Corp.'s MS-DOS over Ethernet. Touch has aligned itself with major investors, including Apple Computer, Inc., and has signed agreements with key vendors, notably Motorola Computer Systems, Inc.

No pay

For the first six months, the initial team of 10 developers lived on no pay. Before Oak Investment Partners came through with initial seed money, founders McGann, who is vice-president of strategic programs, and Morrison, vice-president of operations, told the engineers to start lining up other jobs. "You have to be honest with people," McGann said. "We wanted to make sure they had something to fall back on if this didn't work out."

"We lived on our own resources, and then we supported each other," Morrison recounted. "We even paid for each other's mortgages on our credit cards."

Touch Communications' *Bill Fello, Dennis Morrison and Brian McGann (seated)*

If long suffering and tenacity represent typical business birth pangs, then Touch is still in the start-up mode. "We are not out of the woods yet — until we are profitable," Morrison said. "That will take a while."

Touch has a strong plan and vision. The founders credit company Chairman Charlie Bass, co-founder of network vendor Ungermann-Bass, Inc., as their mentor in the early stages. Bass was one of the first industry supporters who had enough faith in the tiny company to influence his own connections in the venture capital community.

Money matters are very private at Touch. Like many small businesses with less than 100 employees, annual income is kept top secret. The company has raised, however, $4.8 million from investors, including Hambrecht & Quist, Inc., Morgan Stanley Venture Capital and Sequoia Capital.

If OSI technology had a spokesman, it would be the ebullient McGann, who loves to suggest that the Transmission Control Protocol/Internet Protocol de facto networking standard is "dead in the water" and show how the OSI standard is more flexible and durable than any other communications technology around.

The outspoken McGann is the visionary behind Touch. Formerly at Advanced Computer Communications, he wanted to focus on end-user sales and standards.

"Interoperability was a big deal for me back in 1981," he said.

Although employees worked endless hours to meet project deadlines, they also remembered how to have a good time. When the company celebrated its third birthday, Touch threw its biggest bash ever, and Morrison, a drummer by night, provided entertainment with his rock band.

What is in store for Touch in the future? The company has its sights set on nothing less than the stars. Fello said he would like to see Touch become "the Microsoft of OSI applications."

WHAT IS IN STORE for Touch in the future? The company has its sights set on nothing less than the stars. President Fello said he would like to see Touch become "the Microsoft of OSI applications."

Chip firms

FROM PAGE 83

included the following results:

National Semiconductor. The Santa Clara, Calif.-based firm reported net income for the 13-week quarter ended Feb. 28 of $14.7 million, or 11 cents per share. This is compared with a loss of $25.6 million, or 31 cents per share, the firm recorded for the 12-week third quarter of last year.

"People thought they could live with much less inventory [during the computer sales slowdown]. Bringing people back up to their needs when sales recovered was a significant cause of the upturn," said Stuart Johnson, vice-president of research at Wertheim Schroder & Co. in New York

Similarly, revenue was up 74% to $692.2 million, compared with $398.1 million for the same quarter in 1987.

Last year, sales were hit with a $15 million restructuring charge; in contrast, this quarter's net income included an extraordinary credit of $1.5 million, or 1 cent per share.

Results for the quarter included three months of sales and operating performance of the acquired Fairchild Semiconductor Corp., which Johnson said attained its first break-even period since National Semiconductor bought it last fall.

Micron Technology. In a near duplicate of National Semiconductor's turnaround, net income for the second quarter ended March 3 was $16.9 million, or 60 cents a share, compared with a loss of $10.9 million, or 46 cents per share, recorded for the like quarter last year.

Revenue for the Boise, Idaho, firm was $58.3 million, a 190% increase over the $20.1 million reported in the same period in 1987.

Much of the rebound was credited to a newly robust market for U.S. dynamic RAM chip firms.

"After Reagan put tariffs on the Japanese to stop their dumping of dynamic RAMs in the U.S., the Japanese did too good a job of cutting production, and shortages occurred. Micron has benefited from that," said Andrew Kessler, a securities analyst at Paine Webber, Inc.

3Com. Last June's strategic alliance with Microsoft to co-develop and market the OS/2 LAN Manager and September's merger with Bridge may be starting to yield dividends. Sales and orders continued strong for the third quarter ended Feb. 29.

The networking firm posted net income of $6.6 million, or 23 cents per share, a 43% increase over the $4.6 million, or 18 cents per share, reported for the same period in 1987. Revenue was $66.2 million, a 56% increase over the $42.4 million reported for the same period a year earlier.

"The alliance with Microsoft has only just begun to affect 3Com. I'm sure we'll be seeing more of the same in the quarters to come," analyst Richard Kimball said at a recent Montgomery Securities briefing.

On-Line Software. Strong international sales fueled a robust period for the Ft. Lee, N.J.-based systems software manufacturer. Net income for the third quarter was $1.9 million, a 27% increase over the $1.5 million reported for the same period in 1987. Revenue for the quarter was $23.6 million, a 19% increase over the $19.8 million reported for the same period in 1987.

Despite its overall success, On-Line indicated that a restructuring of its sales approach caused revenue from domestic licensing of software products to fall short of expectations.

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People-oriented data centers

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BY MICHAEL BALL
SPECIAL TO CW

Increasing business, and in some cases changing technology are creating job openings at data centers.

Managers report that technical specialists seem to be in adequate supply, although they still command handsome wages. Finding business-oriented data processing staffers is another matter.

Not surprisingly, the greatest demand for outside recruiting stems from the need for managers and specialists. "We've had to buy higher level people," laments Kevin Dinger, technical support manager at Medical Data Reports, Inc. in St. Paul, Minn., "and they are extremely expensive, partly because they always go through headhunters."

'Worth their weight'

One area in which this trend holds true is the need for CICS systems programmers, whom Dinger describes as "worth their weight in gold." But he says that even here, it has been relatively easy to find enough people, even though they can command high salaries.

It is often more difficult to find a generalist than a specialist, says Dinger, who adds that he has become a little leery of specialists because they may be short on people and technical skills. "Our qualifications are pretty stringent, especially our people skills," Dinger says. "There are a lot of people with the technical qualifications we need, but we look for attitudes too — career attitudes and people attitudes."

Dinger has found that the addition of a network and PCs is changing duties and interactions, at least at the managerial level.

"There's no doubt our users are different. We now need people who can talk with our MIS staff and end users, both corporate and client," Dinger says.

Interviews crucial

Identifying candidates with the right blend of talents has led to greater emphasis on interviews, Dinger says. "We can see the technical skills on the resume, but we have to sit down and talk to see what the people skills are."

But addressing the new needs does not necessarily lead to searches for people with the appropriate attributes. "When we have the time, I'd prefer to grow my own," Dinger says. "We train our existing [employees], sending them to the litany of IBM-recommended courses."

Dinger notes that he also finds a need for increased communication skills and intuitive thinking in his own position.

> "OUR QUALIFICATIONS are pretty stringent, especially our people skills. . . . There are a lot of people with the technical qualifications we need, but we look for attitudes, too — career attitudes and people attitudes."
>
> KEVIN DINGER
> MEDICAL DATA REPORTS, INC.

The same sort of technical and managerial expertise is sought at the Chicago data center of retailer Carson Pirie Scott & Co., but the company is hiring as well as training as it grows and upgrades from the DOS operating system to IBM's MVS.

"We're presently growing, and this means we can add people we need and keep those we have doing what they do well," says Michael Szajek, data center supervisor with the company's Information Communication Systems division. He, too, finds that there is a sufficient supply of talent but that getting and retaining it is expensive. "To keep the best ones, we definitely have to pay," Szajek says.

With less client orientation than some data centers, the Carson Pirie Scott center finds itself focusing career paths on technical tracks with increasing challenge, rather than on development of communication skills and related abilities.

"There are plenty of technical places to use our people here," Szajek says. His effort is to steer them away from repetitive tasks, mixing more mundane but necessary jobs with special duties. "People don't just play operator here. We have them doing projects, such as environmental documentation, to keep them interested."

Career paths are similar at a smaller center with fewer options, according to Alexander Rivier, data center director at The Children's Place, a clothing retailer based in Pine Brook, N.J.

The course chosen there is to offer more responsibilities and new assignments while training and promoting from within. When possible, this path leads to new titles. "We are constantly reevaluating our staff structure with this in mind," Rivier says.

The clothing retailer's shop is technologically stable but still growing enough to demand regular attention to internal development and recruiting. Rivier looks for both college-educated professionals for management positions and graduates of technical or trade schools for operations jobs. He says he has not had trouble finding candidates for the technical and professional openings generated by the center's modest growth.

Candidate supplies ample

The same has held true at Munich American Reassurance Co. in Atlanta, according to Janet Baughman, director of data processing. The data center's needs are not growing rapidly, and "enough qualified people seem to be passing through Atlanta that we have no problem finding the programmers we need," Baughman says.

The company, which runs an IBM mainframe shop with a microcomputer network, sees future needs limited to people to support new languages and products as they are added.

Munich American is another company that emphasizes training. "We're small, but we still try to develop our people within the company," Baughman says.

Ball is a free-lance writer based in Boston.

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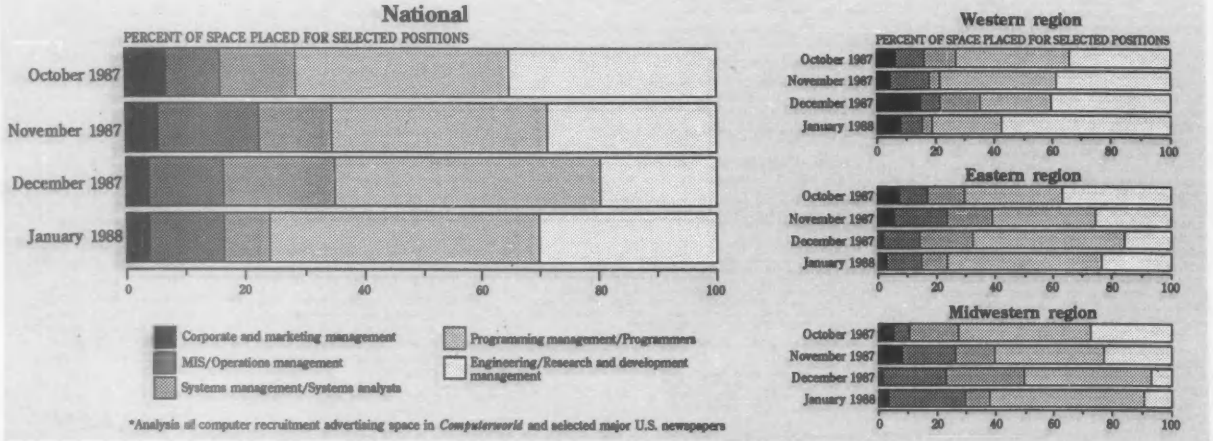

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SPOTLIGHT

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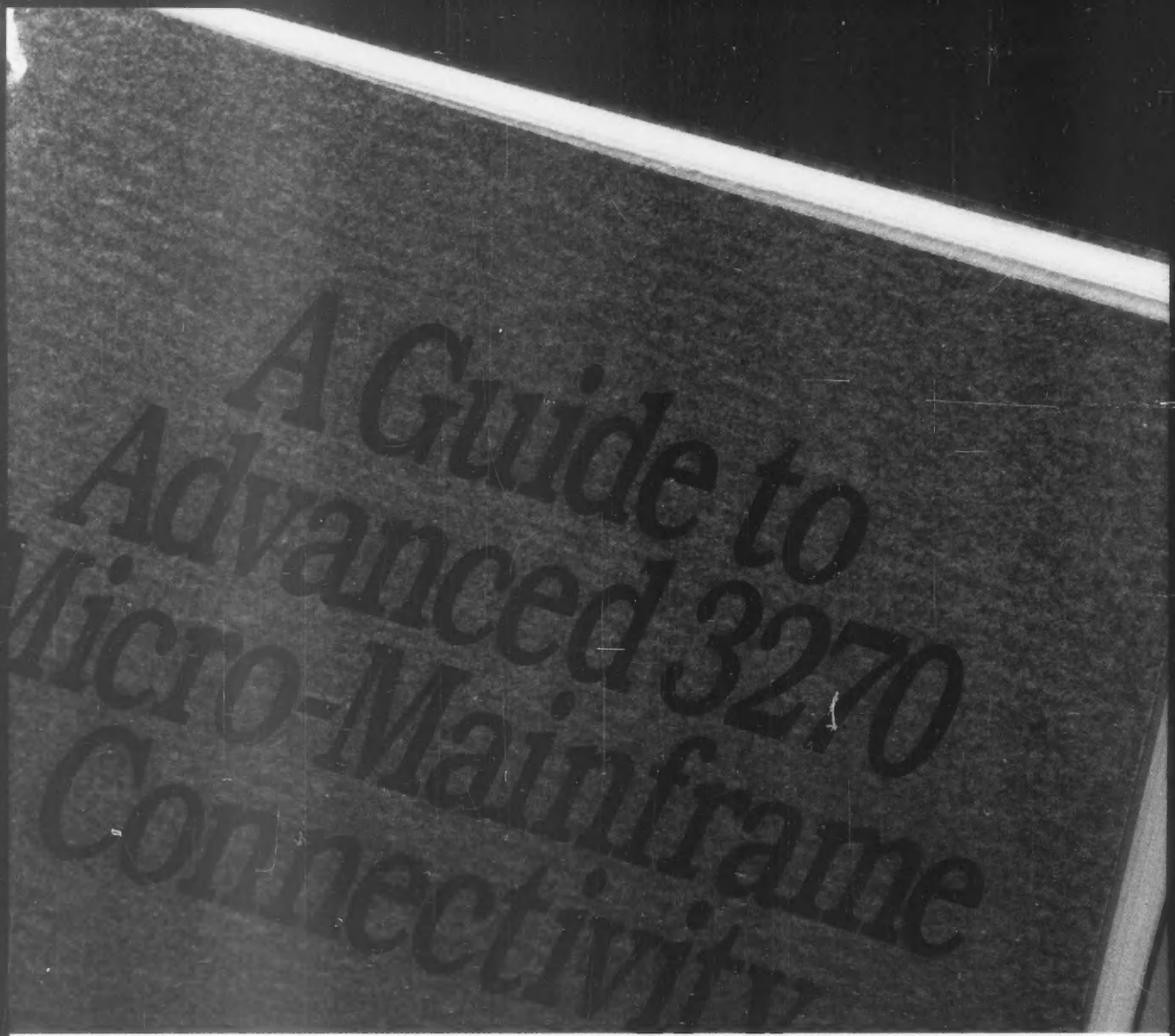

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SENIOR EDITOR
Joanne Kelleher
ASSOCIATE EDITOR
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DESIGN EDITOR
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RESEARCHER
Sally Cusack
ASSISTANT RESEARCHER
Bonnie MacKeil

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PC users want quick, invisible access to host data, but hiding the mechanics is a job vendors are only starting to tackle

DREAMS OF ACCESS WITHOUT EFFORT

BY PETER SCISCO

JULIA TALCOTT

Ric Green, project manager in the communications sector of Motorola, Inc. in Shaumberg, Ill., hasn't a doubt that micro-to-host links will eventually revolutionize the corporate culture. The integration of personal computers with host systems, he says, will profoundly affect the way businesses use information resources. As happened when companies switched from typewriters to word processors, turnaround time will be telescoped dramatically. But while changes are already happening, technology has not yet reached the degree of transparency necessary to shake up the organization on the scale Green envisions.

Motorola's two main computing centers, in Shaumberg and Phoenix, house IBM 3090s. The company has a mix of 11,000 IBM Personal Computer XTs, ATs and Personal System/2s and 7,000 Apple Computer, Inc. Macintoshes, the majority of which are or will soon be connected through 3270 emulation products. IBM 3270 emulation represents the mainstream of micro-to-host linkage today. But as Green knows, that strategy will not satisfy users for long.

Recently, for example, Green installed a micro-to-host link that downloads mainframe data and reformats it as a Lotus Development Corp. 1-2-3 work sheet file. His intention was to facilitate the task of manufacturing cost analysis for a general manager who oversees several divisions. The system automated the previously manual task of entering each division's history and current information into a spreadsheet. More important, the process of retrieving information from separate data bases on several host systems was placed under the manager's control, rather than MIS's, and the time needed to complete the task shrank from days to minutes.

Scisco is a free-lance technical writer based in Charlotte, N.C.

But even that fell short of expectations. "The first time we showed it to [the manager], he said, 'That took too long,' " Green says. "You have to be sensitive to the fact that even though [a link] improves the process, managers still won't understand why it still takes three to five minutes."

Speed is not the only issue, Green says. Managers also want the flexibility of working within applications they already know rather than adjusting to the mainframe environment.

Making it their own

Moving data between mainframes and microcomputers is nothing revolutionary. What is new is the fact that the user community is demanding the right to perform that operation themselves and to own tools with which to do it without having to learn new and arcane procedures.

"The question of transparency is really just the user saying, 'I want access to all this stuff, but I want it to look familiar.' It's a user-driven phenomenon," says Paul Saffo, a research fellow at the Institute for the Future in Menlo Park, Calif.

Departmental managers and high-level executives, once satisfied with running local cost projections and spreadsheet analyses on their PCs, are beginning to realize the limits of the local processor. Saffo points out that the notion of a machine being one-person, one-task, one-terminal is history. Users need to be able to do multiple

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things at once.

"What really is different is the recognition that end users just don't want to know anything about [the linking] process, and they want to have the idea or flexibility that when they get mainframe data, they haven't really left their PC," says Larry DeBoever, president of DeBoever and Associates, Inc., a consulting firm in Acton, Mass.

Seamless access to mainframe data from within a familiar PC application is what users really want. But moving from the point of imagining true transparency to the point of implementing it has proven difficult.

SUNY's Steinbach

"A lot of people talk about transparent access, but I haven't really seen it getting off the ground," says Scott Jensen, a senior systems programmer in the Applied Technology Division of Litton Systems, Inc. in San Jose, Calif. "People have been downloading for years, but it's never been very convenient to do, and I don't think many people have been doing it."

Litton's San Jose facility has 63 IBM PC XTs, ATs and PS/2s linked to the corporate IBM 3090 mainframe in Los Angeles. Most are being used as host workstations, Jensen says, and there is some downloading from the host. "But it's not transparent to the user, I know that," he says. "Downloading is still not an easy thing to do."

Universal Foods' Randall

"Transparent access is typically a hard-won thing unless you're dealing in a vendor-specific environment," says Merv Adrian, managing editor of the *Focus Systems Journal* for Information Builders Publishing in New York. "That's not a typical model, and what we don't have is a lot of generic links."

The user interface ranks as the major challenge for developers of transparent micro-to-host links, according to Charles Pitcher, director of product planning at Rabbit Software Corp. in Malvern, Pa.

What end users want, Pitcher says, is a "single linguistic context. The context they want is whatever they do for a living. If you're a trust officer in a bank, you want every single language term on that screen to be what a trust officer can understand."

IBM 3270 terminal emulation may be the market leader, Pitcher says, but its inconsistent user interface for different applications is a major drawback. "The problem is that all the old IBM 3270 protocols assumed no intelligence on the other side of the network," he says.

Give them what they want

Right now, achieving what passes for transparent linking of microcomputers and hosts requires significant programming effort on the part of data processing professionals.

"Most users don't have the expertise to do it themselves," Jensen says, "so you need to give them [a link tool] that won't require MIS help for them to use." Right now, he adds, the only way to obtain such tools is to write them yourself, which is what he plans to do.

At the State University of New York's (SUNY) Health Science Center at Brooklyn, Len Steinbach, manager of the information center, has also taken the matter of user interfaces into his own hands.

The information center is putting together a 40-node network — a mix of IBM and Zenith Data Systems PCs — and linking it to an IBM 4381 mainframe. The center will use the network in the human resources department to develop and maintain personnel records, coordinate various reports and perform analyses.

The software heart of the SUNY link is VM Personal Computing, Inc.'s Relay Gold, an asynchronous communications package that started shipping in September 1987. Steinbach's team has structured a standard interface around that product that Steinbach says solves a major obstacle confronting PC users who want to routinely access mainframe data.

"We don't want most people to know much more about the micro-to-mainframe interface other than a menu selection," he says. "That's really the key. Then we'll get them where they want to go."

At Universal Foods Corp. in Milwaukee, Bob Randall, microcomputer coordinator, also heard user demand for a micro-to-mainframe link that could be easily initiated from within a PC application.

He eventually decided that "if that link is what they want, then the mainframe people have to

Continued on next page

Operating systems grow extensions

BY LARRY DEBOEVER

In the last 12 months, user demand for transparency has given a new twist to the developmental path of micro-to-mainframe links. Links are now materializing as extensions of operating systems.

Because of their diverse computing enviroments, most medium-size and large organizations will continue to require a variety of link products.

But it is fairly certain that as a ready-made alternative, link facilities offered by operating system vendors such as IBM, Digital Equipment Corp., Microsoft Corp., Novell, Inc. and Apple Computer, Inc. will eventually capture significant market share.

In general, these link products rely on a virtual-disk user interface, which was first tried on local-area networks and later applied to micro-to-mainframe links by companies such as Micro Tempus, Inc. and Phaser Systems, Inc.

Close relatives

The current batch of products from operating system suppliers, however, are most closely related to the original LAN model. In this context, a virtual-disk interface allows a personal computer user to copy files to and from a file server — usually a dedicated PC — by treating the file server as if it were simply another disk drive on the PC. A user might have several such virtual drives allocated on the file server.

The best-known protocol for accomplishing this is Netbios, developed by IBM and Microsoft.

IBM's newest link facility, Enhanced Connectivity Facility (ECF), has been identified as part of the company's Systems Application Architecture. ECF is clearly a major product strategy for the company, which has stated that the facility will replace all of its currently existing link products.

ECF provides a virtual-disk micro-to-mainframe link facility between a PC and an IBM host, as well as virtual-print and virtual-record abilities.

It is an extremely rich facility that includes a wide variety of data transformation capabilities and is clearly intended to provide full PC-mainframe integration. It can also be used to distribute PC software and updates.

DeBoever is president of DeBoever and Associates, Inc., an Acton, Mass., research and consulting firm.

ECF is available on both IBM MVS systems and the 9370 departmental processor under VM/GCS. It uses IBM's Server/Requester Protocol interface, which has been included in the company's OS/2 Extended Edition specifically for ECF support — thus effectively making ECF the micro-to-mainframe link of choice for OS/2 Extended Edition.

DEC gets into the act

For some time, DEC has offered Decnet-DOS, a virtual-disk facility that allows PC users on Decnet to copy files to and from a DEC VAX. This facility is much more limited than ECF, effectively treating the VAX as nothing more than a file server with limited facilities for VAX-to-PC data interchange.

> IT IS certain that as a ready-made alternative, link facilities offered by vendors like IBM, DEC, Microsoft, Novell and Apple will capture significant market share.

DEC did little to promote Decnet-DOS, principally because — until recently — the company was, for all practical purposes, anti-PC. This was probably because DEC did not possess a strong PC product, and every PC purchased by a DEC user meant the company had one less VT100 sale.

In light of its recent deal with Apple to bring Macintosh support to Decnet, DEC is clearly revising its strategy. On the same day that it announced its deal with Apple, the company also said that Decnet-DOS would be bundled at no charge on every version of VMS. In other words, every VAX running VMS is now a PC file server.

These actions amount to a recognition by DEC that, as it increasingly provides systems — VAXs, Ethernet LANs, RDB software and so on — to its customers, those systems will be used by users who are connected to the LAN from a PC.

Part of the plan

Both Microsoft and Novell appear to have developed their own strategies to add link technology to their servers. It is a safe bet that Microsoft will provide a link capability, which could include interfaces to both ECF and Decnet-DOS, as an installable system service for the OS/2 LAN Manager.

An installable system service is an application that will run on top of the OS/2 LAN Manager and will be available to all users of the network. Microsoft has already introduced its first product of this kind, the SQL Server.

Microsoft seems to be acting on the belief that the end user ultimately drives the connectivity process, meaning that the user will have the greatest impact on various connectivity product decisions.

Novell also sees the requirement to provide connectivity to mainframe and departmental processors and is developing a strategy similar to Microsoft's by adding value-added services to its Netware Server.

To underscore this point, Novell announced two micro-to-host software products this month, jointly developed with Phaser Systems, a company privately owned by Raymond Noorda, Novell's chief executive officer, through his investment in Dialogic Systems Corp. Clearly, Novell has come to grips with the market demand for standards-based solutions, causing the company to reconsider its OS/2 posture.

Apple's touch

Not to be outdone, Apple has developed an excellent connectivity staff and invested in Touch Communications, Inc., whose Open Systems Interconnect technology will allow Apple users to access remote hosts as if the hosts were icons.

The company has also worked with Simware, Inc. to develop Mac3270, a link technology that allows Macintosh computers to interface with IBM mainframes as block-mode 3270 devices via various types of asynchronous connections.

In addition, Apple recently acquired Network Innovations Corp., which has developed some excellent connectivity support. An important question is whether there will be room for other link suppliers if all the major operating system vendors provide this capability. The answer is a strong yes, particularly if link vendors are prepared to support interfaces to both ECF and Decnet-DOS within the next 12 to 18 months.

The increasing complexity of networks and the diversity of functions required by users will ensure a considerable and continuing demand for other types of link products.

It is reasonable to expect, for example, that an OS/2 user connected to the corporate network will also require concurrent access to dissimilar hosts located on a LAN, a CCITT X.25 network and an IBM Systems Network Architecture network. •

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adjust to it."

In Randall's case, adjusting meant using Micro Tempus, Inc.'s Tempus-Link and writing code to create a virtual-disk link that users can invoke through a menu.

3M's Waldman

"For us, the access is transparent to the user. I've written some code where the user doesn't even know his Drive D is really on the mainframe," he says. "I don't know if you can get more transparent than that."

Meeting end-user demand prompted 3M Media Services, Inc. in Stamford, Conn., to move from its strict time-sharing activities to a more interactive role with its customers. Bob Waldman, 3M's technical director, says the firm's MSI Plus package grants publishers remote access to 3M's two IBM 4341 mainframes and lets them bring down data they are interested in.

"It's a one-button kind of operation," he says. "Downloads can go from five minutes to 14 hours. We've set it so they can do it in the middle of the night. It's absolutely idiot-proof."

MSI Plus incorporates Relay Gold and Borland International's Paradox, with a shell around both packages. Waldman is currently running the package in three beta-test sites. Users inside MSI Plus move to MSI Link, a part of the Plus package, advance automatically to the mainframe and extract the needed data. They then move to MSI Base, which is the Paradox-based part of the product.

From there, users can transport the data to a Lotus or Ashton-Tate Corp. Dbase III application pretty cleanly, Waldman says. "The data comes down and automatically goes into Paradox," he says. "And then users can manipulate it to their heart's content."

Many users, however, harbor visions of transparent micro-to-host linkage that extend beyond any of these carefully stitched link/interface combinations. Peter Hermann, a director in the computer science division of data processing at The Travelers Corp., says he wants a way to integrate PC documents and specialized files into the firm's central messaging system. His firm has 14,000 to 15,000 PC XTs, ATs and PS/2s in its U.S offices, with IBM 3090s and 3081s in its Hartford, Conn., headquarters and in Norcross, Ga.

Litton's Jensen says he would like to see a link that "would actually download host data in a Lotus format without having to parse it, run an SAS program on it or anything like that. That product would sell a lot of copies. People would love it."

That same belief inspired Lotus's The Application Connection (TAC) development platform product line. "If I'm in 1-2-3 and I need data from [IBM's] DB2, I should be able to make my request and answer all the questions from within 1-2-3," says Scott Eliot, TAC program marketing manager. But for the moment, some see significant gaps in the TAC offering.

Motorola's Green says he would like to see Lotus work on the communications link for TAC, even though that company has kept itself completely out of the communications area. If TAC were linked to an operating system, he says, it would be easier for most companies to install it, adding that getting MIS to build a generic communications routine is difficult.

Unanswered questions

Three levels of concern need to be addressed when looking at micro-to-host links, according to the Institute for the Future's Saffo: "Can I get the data to my machine? And once I've got it, can I process it? Finally, does the data stay alive — can I get it out, can I integrate it?"

Those questions are not yet easily answered by generic products, Adrian says. For a link to function effectively, he says, it must be constructed along three lines:

- Data extraction that gives the user only the information requested — no more, no less.
- The data communications aspects, such as the actual transport of the data.
- Presentation services.

"The different products spread out all over the continuum on how they support one or another [category] or all three," Adrian explains.

Just how much progress is being made and how quickly is a matter of debate. "If you look at what an end user can do with a link, the actual capabilities haven't changed a whole lot in the last few years," says Paul Weinberg, vice-president of Network Innovations Corp. in Cupertino, Calif. "Whether it's a high-speed LAN connection or a low-speed asynchronous direct connection, the capabilities have pretty much stagnated and fall into one of several categories."

These categories start with 3270 terminal emulation, which Weinberg says automatically decreases the value of the PC as an intelligent workstation. The next level is file transfer, which he maintains is not much better, since it still does not recognize the intelligence of the PC.

"Now what you get to do is transparently extend the local hard-disk storage on the PC across the network into the bigger disk on the host," Weinberg says.

DeBoever, on the other hand, maintains that micro-to-host link technology has made significant strides in a short time. "We're in a new generation of links," DeBoever says. "A lot of people haven't paid attention to it. They looked at it a couple of years ago and think they know it. But they don't realize how improved the technology is. And it really has improved substantially."

Transparency of linkage is, after all, an issue that only recently began to demand attention. Before users can begin to think about refinements, they must first be exposed to the possibility of connection, and only now is that happening on a significant scale. Adrian, for example, estimates that of six million potential board-level micro-to-host connections, only about one million have been made.

The Travelers' Hermann

However, micro-to-host connectivity will clearly become a major issue in the near future. International Data Corp. in Framingham, Mass., estimates that by the end of 1991, more than two million PC boards will be communicating with IBM mainframes. And as connectivity advances, some say MIS will discover reasons of its own to support transparent access. Allowing users to request mainframe information on their own solves MIS's application backlog, Adrian says, allowing one person to support large numbers of users.

For years, MIS has maintained strict control over the flow of information within corporations. The trick now is to supply access to that information without jeopardizing security or integrity.

It's payback time for corporations that have invested heavily in PCs and now want to recoup their investments by making the machines — and the people who run them — more productive. And it's pay-up time for vendors, which must create easy-to-use micro-to-mainframe links that operate within MIS's long-established constraints.

A number of vendors have anted up offerings that aspire to that objective. Network Innovation's Connectivity Language/1 (CL/1), released in January, is an SQL-based connectivity language that the firm hopes micro software developers will integrate into their PC programs. In addition, the company released a developer's tool kit for the Macintosh last month.

Weinberg calls CL/1 interactive and session-oriented. "What that means is you could click on a cell that could be translated by the application into a CL/1 request. And then each of the records could be retrieved one by one and placed back into the application — all invisibly," he says.

In January, users also saw Digital Equipment Corp. extend its Network Applications Support (NAS) to the Apple world. Look for Apple to move Appletalk under Open Systems Interconnect, which DEC already has in place, says Joanne Correia, DEC's PC interconnect marketing manager. NAS is also available for Microsoft Corp. MS-DOS and IBM OS/2 applications developers.

A link between DOS-based PCs and Unix-based multiuser systems was announced last month by Altos Computer Systems. This product, Adlantes — scheduled to be released in May — uses Microsoft Windows to allow users to access either type of application.

IBM is making its move toward more transparent links with its Enhanced Connectivity Facilities (ECF), announced last fall. ECF includes virtual-disk technology as well as extraction and formatting of host data for use on PCs. Virtual capabilities are offered through PC-resident requester programs and host-resident server programs.

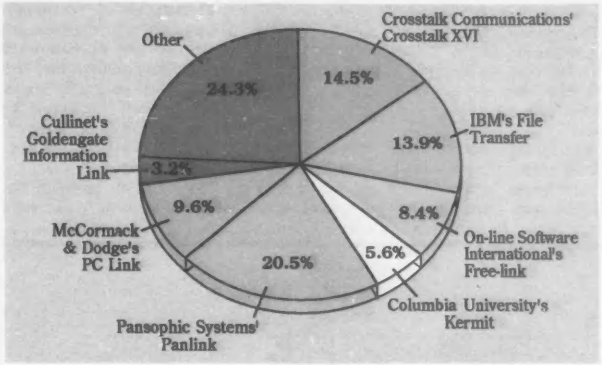
ECF moves way beyond 3270 terminal emulation but not so far that experienced users will forget how they got there.

"Any 3270 user who's familiar with interacting with a mainframe environment would be able to use [ECF] without a lot of technical expertise," says Steve Randesi, a consultant with Gen2 Ventures in Saratoga, Calif.

IBM provides some translation capabilities that reformat the mainframe data into some of the more popular PC formats,

Preference vote

Market shares for micro-to-mainframe links at IBM and compatible mainframe sites



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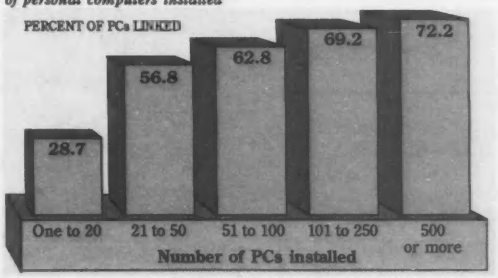
Adoption pattern for micro-to-mainframe links

Penetration at U.S. IBM and compatible mainframe sites by number of personal computers installed



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Randesi says. "The problem is that the translation is done on the mainframe, and it only goes in one direction — from the mainframe down to the PC," he explains. The only reformatting allowed in both directions are sequential files from EBCDIC to ASCII and back again.

Rabbit Software's Pitcher says IBM's High-Level Language Application Program Interface (HLLAPI) allows application developers to write programs that solve the reformatting problem. "The real advantage of HLLAPI might be that it talks to four or five host programs at the same time," he says. "But the user doesn't have to switch back and forth."

What HLLAPI applications have not solved, Pitcher points out, is the way data is sent across the network. The PC interfaces are still being created on the host rather than on the PC. This is an economically inefficient solution, he says, noting that "somewhere between 20% and 50% of the host in a heavy on-line transaction environment is involved in creating the screen processing for the user."

> "YOU don't know how many people are going to go shopping. That may be OK for a supervisor but not necessarily for just anyone."
>
> LEN STEINBACH
> SUNY

The solution for that kind of inefficiency can be found in IBM's Advanced Program-to-Program Communications and in that protocol's transport mechanism, LU6.2.

Once the host recognizes the intelligence of the PC, the PC applications can reformat the data received from the host. From there, the user can dump the reformatted data into a familiar PC application.

How quickly fully transparent link products will materialize and what effect they will have when they do are questions that lack firm answers so far. DeBoever says he expects that within two years, users will be routinely moving 100M bytes of data around networks.

"I've already planned that into our growth," Universal Foods' Randall says. As part of his company's linking its computer resources, he says, token-ring networks will play a pivotal role. "We have configured those token-ring networks to have central servers with a minimum of half a gigabyte each. So if people want to pass files of that size, they'll be able to do it."

There is little doubt that beyond file sharing and data access, data security and integrity are the foremost areas that will be affected by transparent micro-to-host links.

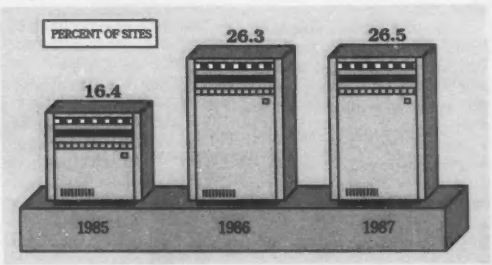
"You have to make sure the appropriate software controls exist in order to know and identify who's doing what," says Mark Wilberts, director of telecommunications and network systems at Land O'Lakes, Inc. in St. Paul, Minn. Most of that firm's 400 or so PCs are linked to an IBM 3084 with Digital Communications Associates, Inc. Irma boards. "If you're an Irma board, we know who you are, at least physically," he says.

But when transparent links bring local-area networks and hosts together, the security problem becomes stickier. "We have one user with supervisory rights, who uses the term 'going shopping' when he wants to see what's going on in the network," SUNY's Steinbach says. " 'Going shopping' is an interesting phrase to use. You don't know how many people are going to go shopping. That may be OK for a supervisor but not necessarily for just anyone."

Obviously, the software that makes access to host data easy and automatic should be strictly controlled within organizations. The products themselves will do

Slowing tide

Penetration of micro-to-mainframe links levels off at IBM and compatible mainframe sites



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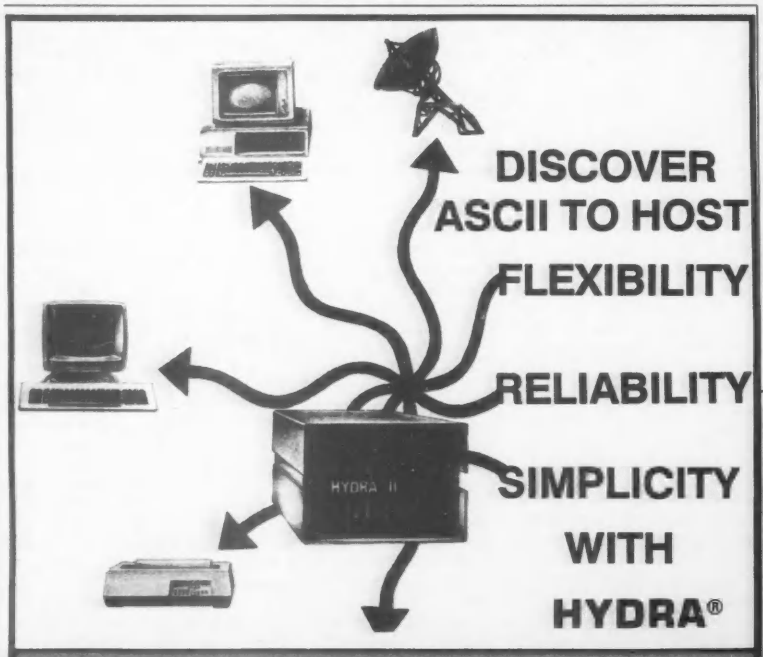

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nothing to change the traditional role of MIS as the controller of security as well as information; in fact, the products will most likely emphasize that role.

"MIS has grown up around the idea that they are the guardians of the data, and it's appropriate for them to be," Adrian says. "Any product that purports to provide access to people who need to use it has to make sure that it does that within the constraints legitimately established by the MIS people."

"Once MIS has coded security, there's no way they're going to listen to an upstart like Lotus say, 'Hey, abandon your security, we're going to supply it for you,' " Lotus's Eliot says. "Maybe if you don't mind having your lungs pulled out through your

Land O'Lakes' Wilberts

mouth, it's OK."

"We've got some real paranoid people on our mainframe," Randall says. When Universal Foods put its first asynchronous environment together, he explains, there were quite a few reservations and questions.

"They were afraid you'd hear some guy at a party say, 'Hey, do you want to see what the president makes?' and log on and look at it." That scene has never played out, Randall says, but it is indicative of the resistance transparent micro-to-host links face as they come into the workplace.

Keeping data shipshape

Maintaining mainframe security on the eve of link transparency may cause MIS managers some sleepless nights. But the thought of maintaining the integrity of the host's data after it has been manipulated on the PC level conjurs visions of dazed DP managers awash in roiling seas of inconsistent records and files.

"We're going to have some real interesting problems," SUNY's Steinbach maintains. "I think it's going to be an interesting experiment in the management of that department."

Easy-to-use links and more LANs means that more and more data will be carried out on the networks, DeBoever says. "It'll be a huge administrative nightmare, once you get going, to try and manage distributed data. We'd like to think that somebody's going to manage it, but in the near term, I don't see any organization that's willing to step up to that problem," he says.

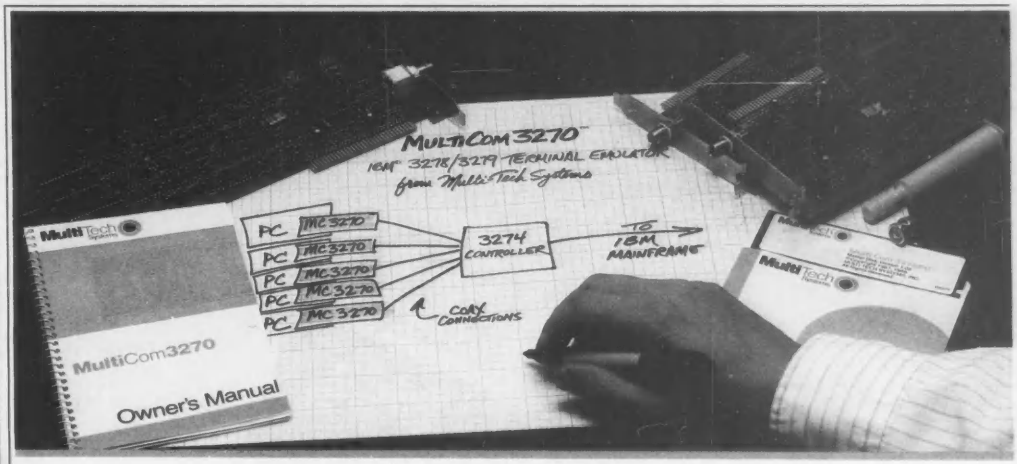
Others downplay the problem of mainframe data integrity, arguing that the same filters that maintain integrity now will function similarly in the future. The number of users accessing the data is not a problem as long as constraints are placed on the upload process.

"If the user can go on-line and change the data, that's fine. He's functioning as part of the system," Land O'Lakes' Wilberts says. "But I'm concerned about moving it back up, unless the process is written in a systems environment where a programmer or systems analyst has written the PC part as part of the system and doesn't let the user go in and modify that code."

Making sure the PC data matches the host data should not be MIS's concern, Universal Foods' Randall says. "If you want lots of users to get identical information, you want to keep it on the mainframe," he says. "Once it's down on the PC, if any data doesn't jibe with a report that was created on the host, it's tough. It's the user's problem."

Besides, the Institute for the Future's Saffo says, the benefits of more open exchange really do outweigh the risks. More transparent access to mainframe data will increase the data's value to the company.

"We tend to entomb information in large computers, and the process of entombment is so complex that people are relieved just to leave it there," he says. •



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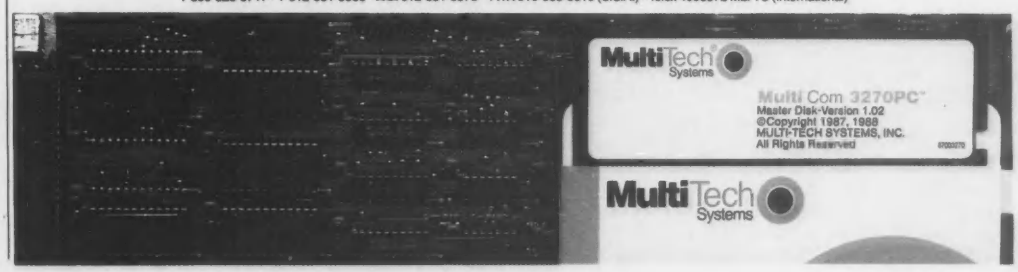


Making sense of mainframe access

BY GLENN MILLER

A main course of action on the business agenda for the next decade is to further leverage corporate information assets. One way to do this is to provide end users with greater access to mainframe data bases.

While many issues, such as security, data administration and software integration, must be considered, there are only three basic methods of connecting the personal computer to the host: modems, direct connections and links through local-area network gateways.

Miller is director of strategic planning at Businessland, Inc. in San Jose, Calif.

Modem connections are widely used today. They involve a PC concurrently running a terminal emulation package and a modem control program. The PC is connected to, or internally houses, a modem that allows it to dial into a second modem connected to the host computer.

Modem connection is distinguished by its low cost and flexibility. Modems, used with either asynchronous or synchronous protocols, range in speed from 300 to 56K bit/sec. Modems ranging in speed from 1,200 to 9.6K bit/sec. cost between $400 and $1,500 and can be easily relocated to accommodate mobile users.

The limiting performance factor for this type of connection is the phone line's bandwidth. While 2,400 to 9.6K bit/sec. is suitable for basic terminal emulation, this speed range would typically be unacceptable for file transfers, heavy screen transfers and cooperative processing.

Direct connections are also in widespread use, having been popularized by Digital Communications Associates, Inc.'s Irma card. The PC runs special emulation software and communicates with the add-in emulation board. This board is connected via coaxial cable to a mainframe front-end processor or a cluster controller, making the PC look like an IBM 3270-class dependent terminal.

Distinguishing features

Direct connections are distinguished by high performance, convenience and higher cost. As a directly connected workstation, the PC can transmit as fast as the cluster controller will allow, since it is not sharing the connection line with other PCs. When standard coaxial cable is used as the connecting medium, no additional cabling is required other than what might already be present for 3270-class terminals. The higher cost of direct connection is attributable to the expense of the emulation board and software, which average $1,200 per workstation.

An increasingly popular option is LAN gateways. In this case, one PC on a LAN maintains a connection with the host via cable or modem, with the other PCs sharing this connection. This spreads both the cost and the bandwidth of the connection across the PCs.

THE current question is not whether connection to the mainframe is possible but which method makes business sense.

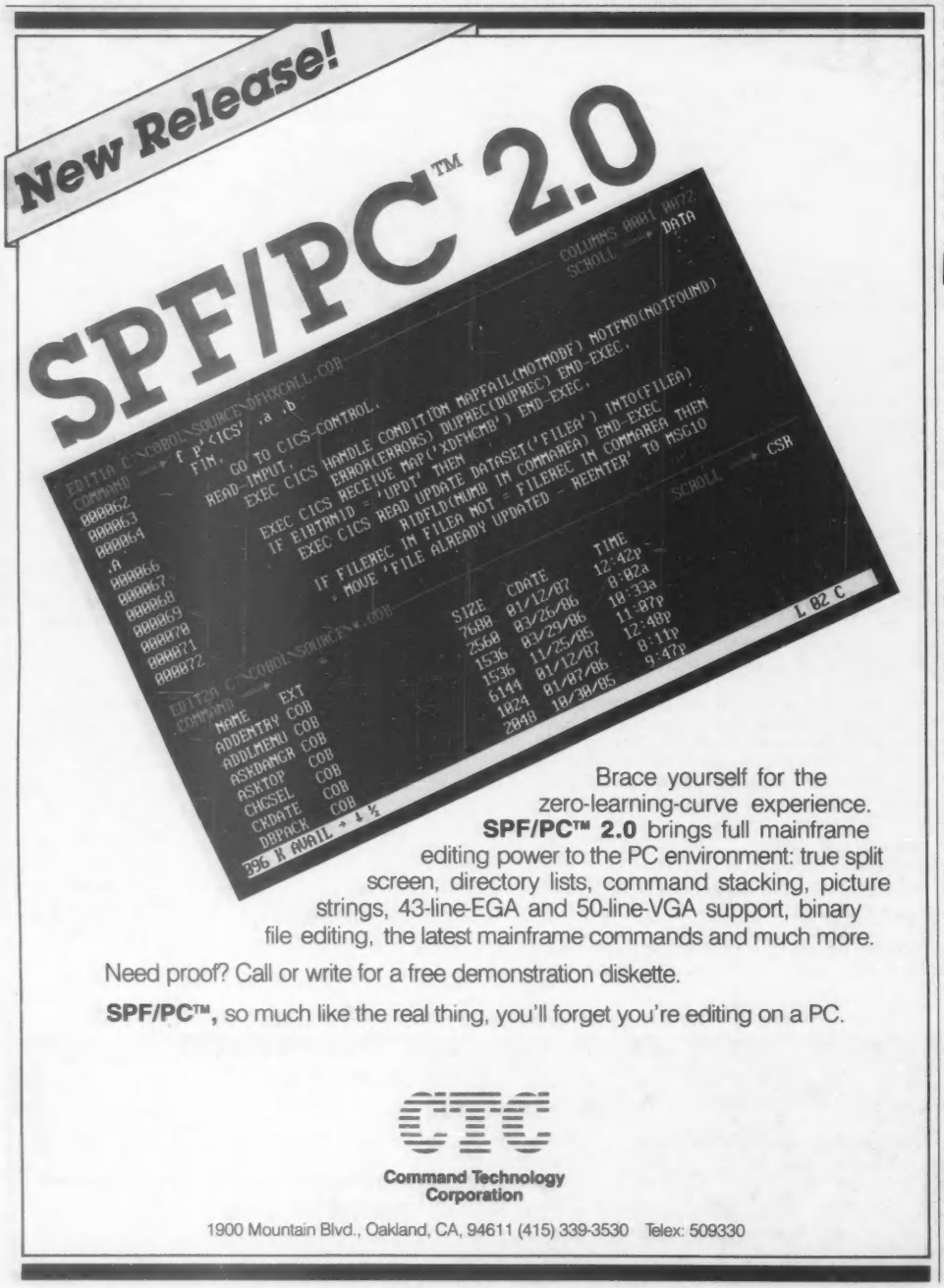
The lower cost of the LAN connection — between $500 and $850 per node — vs. direct connection — with a cost of about $1,000 to $1,400 per node — makes the former option look attractive from a cost-justification standpoint. Although there are other cost considerations, such as cabling and installation, gateways often make good business sense for as few as six to 10 workstations.

LAN gateways offer several other advantages. With the availability of enhanced protocol conversion, these gateways can permit multiple connections to multiple environments, fostering integration of the IBM Personal Computer, Apple Computer, Inc. Macintosh and Unix platforms.

Today, gateways exist for both standard Ethernet and token-ring LANs. The PC that acts as a liaison between the LAN and the host can be connected either directly or via a modem. In addition, token-ring networks offer direct connection into selected models of the cluster controller or front-end processors.

The performance trade-offs for this solution are predictable: A shared resource can become a bottleneck. If the bandwidth requirements are high, a direct connection will perform noticeably better than a PC working via a LAN gateway.

In the past, the question was, "Can I connect my PC or Macintosh to my mainframe?" Now, the question is radically different: "Of the many ways to make this connection, which one makes the most business sense for this user community?" The second question, now that workable options exist, is considerably safer from a strategic MIS standpoint. •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Data link speeds tax filing, refunds

BY BILL BRANDEL

There is no escape from taxes, but computer connectivity is helping to ease the pain of filing for some taxpayers. A private communications link connecting field offices of tax preparer H&R Block, Inc., a special loan division of Beneficial Finance in Peapack, N.J., and the IRS, now offers the prospect of quick delivery on income tax refunds.

At IRS-approved electronic filing centers run by H&R Block, customers have the option of expediting their refunds via a service called Rapid Refund.

H&R Block, which began the service in a more limited version without electronic data transfer in 1976, currently uses data link software to send tax refund data to the Beneficial Finance subsidiary, Tax Masters, which sends back authorization to tender a return check. The authorized amount is then "loaned" to the customer from a Beneficial subsidiary bank located in Wilmington, Del.

Simultaneously, H&R Block sends the customer's income tax return information to the IRS, which then transfers the refunded amount electronically to Beneficial, thus paying off the loan.

Brandel is a free-lance writer based in Allston, Mass.

New package used

The link software currently employed by all the participants in the exchange is Blast Private Network from Baton Rouge, La.-based Communications Research Group.

This product, which recently replaced another link package — Rcom from Computer Vectors, Inc. — consists of file transfer software that can integrate with applications software by connecting micros, minis and mainframes running different operating systems.

It can also transfer data from a diskette into these systems and offers full-duplex data transfer over asynchronous lines.

Blast Private Network is customized for every purchaser to allow communications between designated operating systems. In this instance, customer information files had to be uploaded to and downloaded from Digital Equipment Corp. VAX 8550 equipment at H&R Block's Kansas City, Mo., headquarters and IBM Personal Computer XTs and ATs at its field offices as well as to Data General Corp. MV/4000 minisupercomputers and IBM 3080 mainframes at Beneficial and IRS sites.

The key for H&R Block, having invested considerable effort in developing its own software to process complicated tax forms, was to find a product that would interface reliably among all the systems involved and permit secure, unattended communication.

Using the Blastscript programming language, unattended VAXs can automatically dial the PCs and download or upload tax information overnight. A security feature provides password control and allows the system manager to stipulate who can send data on which network.

There were other factors that influenced Beneficial's decision to make the shift to Blast Private Network.

"We needed something that was ASCII-compatible," says Tom Trader, director of data processing for Beneficial's Tax Master program. "Then too, Communications Research licenses this package in volume, which dramatically decreases our purchase costs, and offers capabilities to provide data links in a multivendor environment."

H&R BLOCK, overwhelmed by the unanticipated popularity of Rapid Refund, has thus far been unable to keep its initial promise of overnight delivery.

As is usually the case when taxes are involved, there have been complications. H&R Block, overwhelmed by the unanticipated popularity of Rapid Refund, has thus far been unable to keep its initial promise of overnight delivery, despite an upgrade from Microvax II to VAX 8550 machines and a refinement of its own software to increase processing speed.

According to Bill Hicks, H&R Block's director of information systems, the current logjam has nothing to do with the link product but with inadequacies in supporting equipment and staffing. In an effort to get ahead of the present backlog, Hicks has purchased faster modems and multiplexers, beefed up his supply of DEC VT220 and VT320 terminals and added IBM Personal System/2s.

Even that shopping list does not address the heart of the problem, however. "The real problem," Hicks explains, "is that we are a seasonal employer, with 15 people on our technical support staff, and we are supposed to support all this."

Still, the company's plans for expansion remain ambitious. While only about 10% of H&R Block's tax preparing offices have implemented the service, the goal is to have one-third of its offices using Rapid Refund next year.

"I've been told that the IRS intends to offer nationwide electronic filing by 1991," Hicks says. "We intend to be in step with that expansion." •

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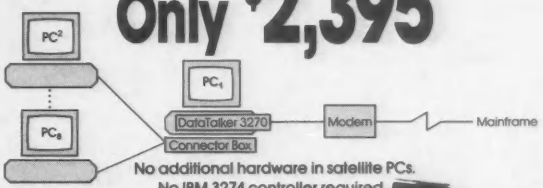

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MIS changes tune on data access

BY GARY ROBINS

MIS managers still voice some concern about the security and control of data in micro-to-host links. But the companywide benefits reaped from such connections have tipped the scales in this technology's favor. End users on micros are obtaining more and more access to the mainframe, with MIS taking an active role in initiating the changes.

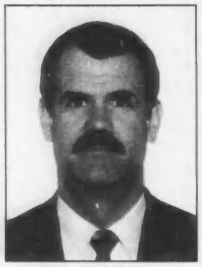
"We're giving end users the hook instead of the fish," says Ron Stockton, director of MIS at Club Corporation of America (CCA)-Financial Management Corp. in Dallas, describing his organization's effort to invest end users with the ability to query, extract and download data from the mainframe data base.

CCA is in the hospitality business, managing more than 170 clubs and resorts throughout the U.S.; Financial Management maintains the central records for each club and resort on an IBM 4300 series mainframe at its headquarters in Dallas, using a variety of Applied Data Research, Inc.'s (ADR) software tools in conjunction with ADR's Datacom/DB relational data base.

CCA's regional management teams use information provided by the host system to oversee the organization's business, which is segmented into five geographical regions. Traditionally, information had been provided on printed reports, and regional managers would rekey the data from those into their IBM Personal Computer XTs, ATs or Personal System/2s or their Compaq Computer Corp. or Epson America, Inc. IBM-compatible microcomputers.

Now, however, CCA is bridging the gap between Financial Management's mainframe system and the micros of its regional managers using ADR's PC Datacom link. With PC Datacom, managers can tap the mainframe for the data they need, from demographic information to financial data for exception reporting to specialized information such as how many members enjoy horseback riding.

Cautious in his approach to providing nontechnical end users with a micro-to-host querying tool, Stockton evaluated PC Datacom during a nine-month period. His security concerns about access to mainframe data were satisfied with the PC product, because it works in conjunction with another ADR mainframe product, ADR/Datadictionary. The dictionary is able to control requests for data and restrict access down to the data value level.



CCA's Stockton

CCA managers use their micros to formulate their own queries. These queries are passed to ADR/Datadictionary for validation and are then moved to the data base.

Stockton says he regards the step of providing micro-equipped managers with query capability as a necessity, not an option.

"As long as it's controlled, then I'm taking away a large backlog of user demands in a traditional application development sense," he says. "And I'm also giving the front-line managers what they really need to make good business decisions in a timely fashion."

One of the missions of the MIS organization at Campbell Soup Co. in Camden, N.J., is to make data more accessible to users, says Harry Wallaesa, Campbell's vice-president of management information systems.

Furthermore, Campbell is an IBM DB2 site, and the company is committed to the goal of constructing an environment that takes full advantage of the relational data base, including its suitability for ad hoc queries. "I think our commitment to a relational data base is indicative of our commitment to giving users these kinds of facilities," Wallaesa says.

The corporate office at Campbell uses a combination of approximately 800 PC ATs and IBM 3270 workstations tied to two IBM 3090s. IBM's 3270 PC Workstation Control Program is the company's standard micro-to-host link, providing rudimentary file transfer.

The IBM program, according to Wallaesa, also provides a jumping-off point for more sophisticated products used by the firm, such as Micro Decisionware, Inc.'s PC/SQL-Link.

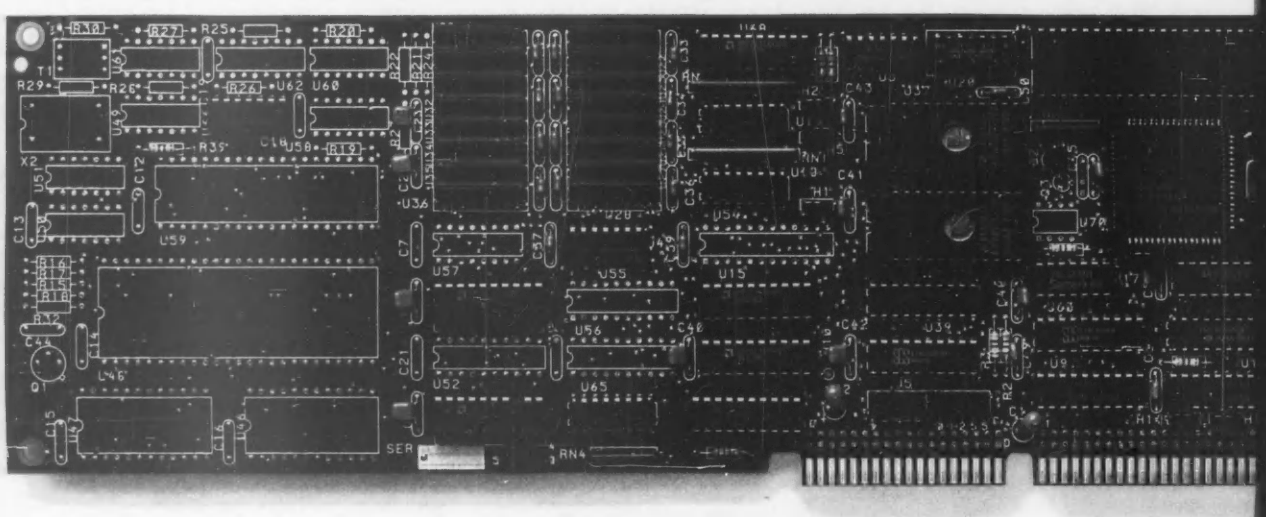
Controlling ownership

Wallaesa's security concerns focus not just on the mainframe-resident data but also on the data drawn from the mainframe and currently residing on the micro. Once on the micro, the data is in an unprotected environment: Security controls are minimal, access is difficult to control, and the data can be "owned" by anyone with an extra diskette.

To help with security at the micro level, Wallaesa is investigating the concept of distributed security administration.

Currently, security is administered by MIS; under distributed security, responsibility would be handed to the end-user departments. Security policies and standards would be clearly defined by the company, but each department would be responsible for setting and enforcing

Robins is a free-lance writer based in Philadelphia.



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its own security parameters.

While security at the micro level is still open for discussion, at the mainframe level it seems to be generally well in hand. Tony Bachman, administrator of information services for the city of Columbus, Ohio, reports that mainframe security was not a major concern for him in micro-to-mainframe linking.

Bachman notes that all links to the city's four Unisys Corp. systems — three V380s and one B3955 — must first go through a Unisys CP3680 communications processor on the front end. The communications processor has five levels of security, addressing Bachman's mainframe access concerns.

Today, the city of Columbus has 94 micros, 35 of which are linked to a host with Intercomputer Communications Corp.'s (ICC) The Perfect Mate communications products.

At this point, the link provides emulation and file transfer capabilities via ICC's Intercom 102 emulation software and File Express file transfer packages. While Bachman says he is apprehensive about offering users data base extraction capabilities, he is comfortable with giving those who want to work locally the ability to download files.

One of his major concerns, however, is end users' penchant for products not cleared by his department. According to city regulations, all hardware and software purchases must be approved by a municipal commission. However, some users had been getting around that by buying on their own. Now, controls have been tightened so that nothing can be purchased without first going through the commission.

Columbus's Bachman

For the future, the micro-to-host relationship in Columbus may be on firmer ground: One of the areas Bachman will be exploring is the use of diskless workstations that use the host for all storage. This technology may also help alleviate some of the security concerns at the micro level, since users will not be able to store data locally.

As the concept of the diskless workstation indicates, the responsibilities on each side of the micro/host equation are becoming more clearly defined. MIS executives who have been involved with micro-to-host links through the years are eager to see this definition develop.

The Federal Home Loan Bank of San Francisco has been using micro-to-host links for more than three years. The bank uses Digital Communications Associates, Inc.'s (DCA) Irma and Forte communications products to handle emulation and file transfer requirements for its PC ATs. The bank uses the DCA tools mainly to provide an interface for its IBM Professional Office System (Profs) and to tie the micros into the overall network.

According to Nancy Gugliemotto, administrator of the bank's information center, one of her department's goals is to provide full document transfer capabilities throughout the network. When this is achieved, the responsibility of storing the data will probably fall on the mainframe.

"Right now," Gugliemotto says, "the users have the option of storing their documents wherever they want. But we are looking to implement Profs document handling on the mainframe, which we think will be valuable in controlling their documents."

Giving users easier access to data without their having to worry about managing disks or backing up data is also a major point with Norman Shaw, vice-president of MIS for Toronto's Dylex Ltd., one of Canada's largest retailers. Dylex has been involved with micro-to-host links for several years and uses different products, including McCormack & Dodge Corp.'s PC Link and On-Line Software International, Inc.'s Free-Link, to extract and download data, depending on the file or data base to be accessed. The company maintains an ADR Datacom/DB data base and uses PC Datacom as the micro-to-host link.

Dylex's Shaw

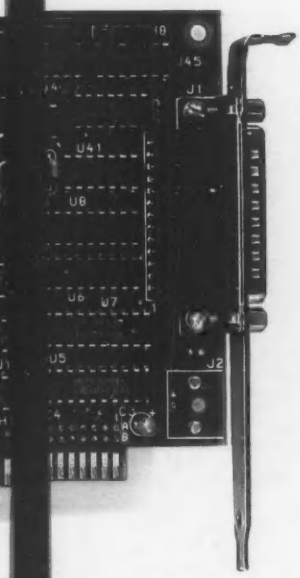
Shaw has been trying to determine when it is best to download data to the micro and when it is best to leave it on the mainframe. For example, he asks, if a user is going to produce a customized report, is it better to produce the report on the micro using micro-based software or on the mainframe using mainframe-based products that can produce the same report?

Many variables need to be considered, but Shaw focuses on two factors. One is the amount of data that needs to be brought down; the other is what the user is ultimately going to do with the data.

If the amount of data requested is large or if the user is only going to browse through the data, he says, it is better left on the mainframe. If the user is going to do something more with the data than just look at it — develop reports or spreadsheets, for example — and if the user is able to select a relatively small amount of data, it is better to download.

Users should benefit from the micro's ease of use, Shaw says, but they should also take advantage of the mainframe's data management capabilities so that they need not be bothered with managing a hard disk, backup or any associated tasks.

"If you marry the micro properly with the mainframe," he says, "you can get the best of both worlds." •



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Continued on page S16

VENDOR VIEWPOINT
The road to global access

BY LEN PALMER

Terminal emulation products and their more capable descendants, micro-to-mainframe links, have played a pivotal role in corporate information processing in its evolution from a centralized DP environment to one that is distributed, or "PC-centric."

Thanks in large part to the continual advances made in that family of products — from basic emulation to application program interfaces, multiple-session capabilities and, most recently, local-area network gateways — personal computers are now becoming the center of distributed processing. The mainframe, meanwhile, is becoming just another resource in corporatewide networks.

PC capacity has increased enormously in recent years, giving micro-to-mainframe link users much higher processing performance.

For example, the current IBM Personal System/2 Model 80, with its 20-MHz Intel Corp. 80386 processor and addressable memory of 4G bytes, exceeds the capacity of many mainframes. Because of this kind of growth, processing that used to take hours can now be done in a matter of seconds.

While PC processing power was increasing, applications like Lotus Development Corp.'s 1-2-3 were being developed, and micro-to-mainframe applications such as Micro Tempus, Inc.'s Tempus-Link were offered.

Another important area of concurrent development has been network technology. In 1976, IBM announced its Systems Network Architecture (SNA), which provides the ability to connect terminals, or workstations emulating terminals, to computers. Along with basic connectivity, the seven-layer model of the SNA protocol stack has dramatically reduced the time required to provide computer solutions. Applications firms can concentrate on their areas of expertise. Graphics, data base and terminal emulation vendors can now offer integrated solutions.

As SNA took shape, LANs entered the marketplace and provided the ability to economically share printers and store files.

The golden gateway

All of these strains of development came together at the evolutionary juncture, where the mainframe became a resource to be shared on the LAN. This was accomplished by extending micro-to-mainframe technology to the LAN through a gateway. Evidence of these gateways' importance to terminal emulation users on the LAN is shown by projections provided by Framingham, Mass.-based International Data Corp. These statistics say installed gateways will increase from 11,000 units in 1986 to 67,500 in 1989.

In the future, global information sharing among PCs will be provided through peer-to-peer communications. IBM has already signaled its intent to support the LU6.2 protocol under Systems Application Architecture (SAA).

In this scenario, PCs, mainframes and other intelligent devices within the SAA environment will communicate with one another with equal facility, no longer bound by the hierarchy of host control.

IBM's plan will permit the off-loading of mainframe processing to other intelligent devices. Worldwide access to these devices will be provided to users through the extension of LAN technology to wide-area networking via peer-to-peer communications.

With SAA, data base access will be possible across a range of computers acting as network nodes. For example, maintaining a distributed parts inventory would be feasible under SAA through the linkage of geographically distant warehouses to the headquarters host.

Each local warehouse could maintain its own accurate inventory, based on its time zone and processing schedule. Inquiries about parts availability anywhere on the network would result in systemwide transactions using an SQL-based data base retrieval system.

The number of on-line transactions processed at the central site would be reduced, as the data and inquiries tend to be localized on a particular LU6.2 node even though the data continues to be available to the central computing resource.

As SAA advances, the token-ring network will become the standard connectivity medium. Transmission speeds of 500M bit/sec. are being discussed for future implementation.

The new structure of corporate computing is still evolving and, in fact, will take years to complete. But as micro-to-mainframe links and earlier terminal emulation products helped move PCs into the business environment, future developments in the realm of PC-centrism will build on these foundations. •

Palmer is vice-president of marketing for the communications division of Novell, Inc. in Mountain View, Calif.

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APIs: Next step to link micros with mainframes

BY MIKE NEW

Application program interfaces (API), which take advantage of the intelligence in personal computers to improve the exchange of corporate information, represent the next logical step in micro-to-mainframe links.

An API allows an application program running on a personal computer to interact with another one on the mainframe and to perform tasks ranging from the simple — such as taking care of routine logon operations — to the sophisticated — such as integrated PC-to-mainframe data base management.

End users as well as vendors are already taking advantage of APIs to tie PCs and mainframes more closely together. As this trend continues, what we've come to know as connectivity will look completely different.

Right now, however, just sorting through the variety of API acronyms and options can be a daunting task. Terms like APPC, HLLAPI and ECF/SRPI are being tossed around as if we all understood them. What are they? And how do you decide which one — if any — is best for you?

The major options

IBM has defined three major APIs for micro-to-mainframe links: Advanced Program-to-Program Communications (APPC), Enhanced Connectivity Facilities/Server-Requester Programming Interface (ECF/SRPI) and High-Level Language Application Program Interface (HLLAPI).

APPC and ECF/SRPI both require special applications software on the mainframe. They were designed for new applications and will be used most often by vendors offering highly integrated micro-to-mainframe application products.

HLLAPI does not require special mainframe software; it was designed for use with existing mainframe applications such as order entry, payroll and inventory. In this case, the PC provides all of the enhancements, and nothing is disturbed on the mainframe.

Realistically, a company could end up using all three of these APIs. They are not mutually exclusive, and each one possesses unique strengths.

Of the three, APPC is the interface most talked about, because it represents the ultimate realization of the concept. But while there is no question that APPC, with the comprehensive set of functions it offers, is a powerful API, actual implementation may be a long and expensive process.

APPC requires the LU6.2 protocol, which differs considerably from the 3270 LU2 protocol that now predominates. APPC and LU6.2 are based on a peer-to-peer architecture, in which computing power is distributed throughout the network, and any processor, including the personal computer, may initiate and control sessions.

JUST sorting through the variety of API acronyms and options can be a daunting task. Terms like APPC and HLLAPI are being tossed around as if we all understood them.

Current mainframe applications, however, were probably designed to talk to IBM 3270 terminals; all of the intelligence and session control is in the host. Likewise, major IBM subsystems such as CICS and IMS have been designed to support the 3270.

The changeover to APPC is complex and probably out of the question for current applications. APPC applications should be designed from the ground up in order to take advantage of distributed processing.

To make things easier, IBM introduced ECF/SRPI. Like APPC, ECF/SRPI requires special software on both the PC and the mainframe, but it stops short of peer-to-peer protocols. Instead, it uses the familiar 3270 protocol to exchange information between PC and mainframe applications.

Once again, rewriting applications to use ECF/SRPI is probably not feasible, but doing so protects the investment in the 3270 protocol. The terminal drivers in CICS, TSO, CMS and so on are still useful, as are current VTAM, ACF/NCP and 3074 series control units.

IBM's first round of Enhanced Connectivity Facilities, introduced last fall, uses ECF/SRPI to allow mainframe resources to be treated as extensions of the PC. The virtual-disk facility allows mainframe disk storage to be accessed using common

New is vice-president of marketing at Attachmate Corp. in Bellevue, Wash.

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INFRONT also has an automated runtime process that allows it to immediately recognize which 3270 screens have PC-based forms. If there is a PC-based form INFRONT will display it, otherwise the original 3270 screen will be displayed. This means that you don't have to convert all of the 3270 screens in an application in order to use INFRONT. You only convert the screens that need to be converted. In short, INFRONT can move your use of the PC into a new realm, the realm of cooperative processing.

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DOS commands. Virtual print makes high-speed mainframe printers appear as PC-connected printers. Virtual file facility provides a simple mechanism for translating files between PC and mainframe formats.

IBM has also indicated that these ECF/SRPI applications will migrate to APPC.

If you are not quite ready to scrap your current payroll system and rewrite it for APPC or ECF/SRPI, HLLAPI may be the best choice. With some simple PC programming, you can reap substantial increases in productivity without ever touching the host software. HLLAPI uses the PC's intelligence to improve the way people work with the mainframe while still looking like a basic 3270 terminal to the host applications.

The concept of HLLAPI is simple: What the user sees on the PC screen can be different from what the mainframe presents. Instead of a complicated logon, for example, the PC user might simply select a task from a menu. The HLLAPI would then perform all the mainframe transactions necessary to complete the task.

Whether users see these transactions or something completely different is up to MIS. It's a great way to breathe new life into hard-to-use mainframe programs — without changing a single line of code.

When used with 3270 software with multisession capability, HLLAPI provides the means to integrate separate mainframe applications. If, for example, order entry and inventory applications are on different systems, the personal computer can be used to combine the information into one simplified screen — once again, without mainframe reprogramming.

HLLAPI was first introduced with the IBM 3270 Personal Computer and has since gained considerable popularity. It allows PC programs written in high-level languages like Cobol, Pascal, C or Basic to interact with the mainframe. HLLAPI remains available for use with 3270 emulation programs from IBM and Attachmate Corp. and will be included with OS/2 Extended Edition.

WHILE THERE IS no question that APPC, with the comprehensive set of functions it offers, is a powerful API, actual implementation may be a long and expensive process.

APPC, ECF/SRPI and HLLAPI will play important roles in future products from IBM. Some time remains before APPC becomes viable, but both ECF/SRPI and HLLAPI can offer solutions today. Of the two, HLLAPI is the clear choice for improving existing mainframe applications.

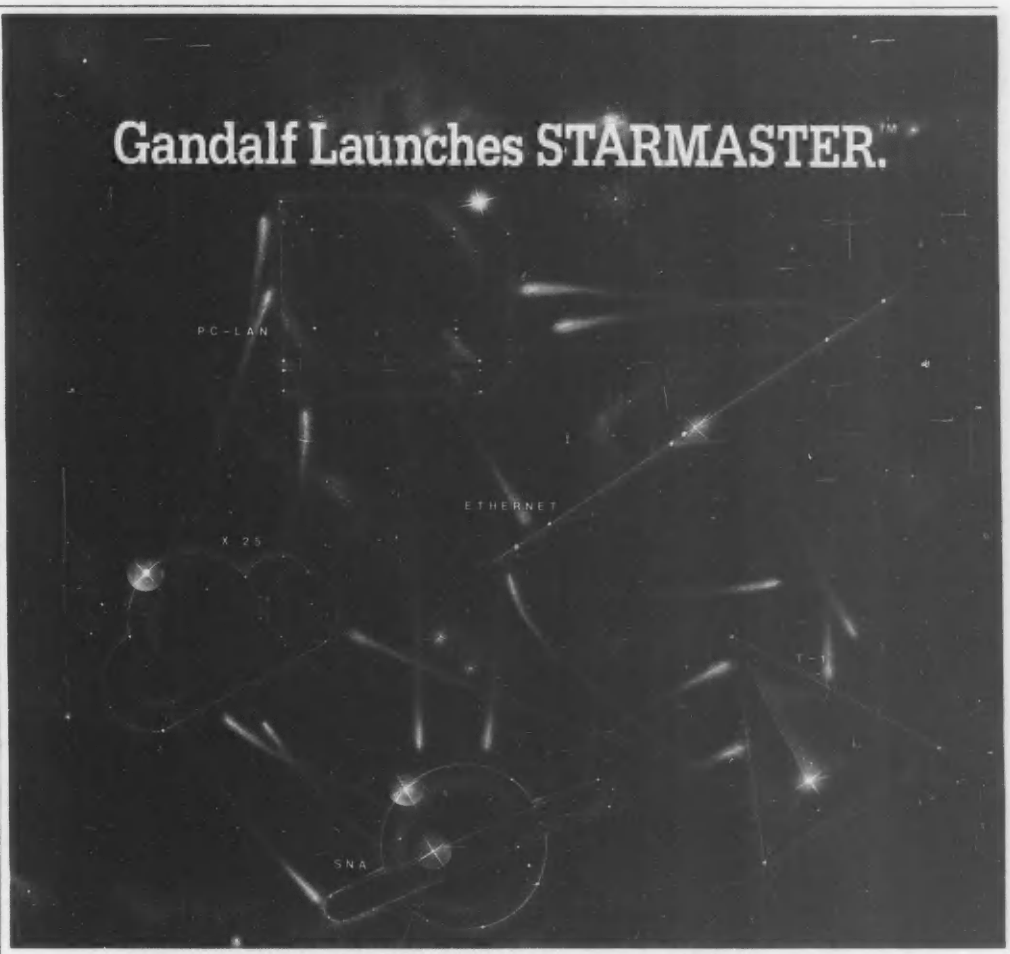
All three APIs have one thing in common: They go beyond basic terminal emulation and put the PC processor to work in ways that make good business sense. ●

Ask the vendor about . . .

- IBM-compatible personal computers, portables and laptops
- Printers
- Data communications
- Computer-aided software engineering products

Upcoming issues of Spotlight will explore these subjects. We invite readers to submit vendor-specific questions in these areas so we can obtain the answers for you and for others with similar concerns.

Please address all submissions to Deborah Fickling, Associate Editor, *Computerworld*, 375 Cochituate Road, Framingham, Mass. 01701-9171.



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Micro-to-host protocol converters

COMPANY	PRODUCT	PROTOCOLS SUPPORTED	MICROCOMPUTERS SUPPORTED	HOST SYSTEMS SUPPORTED	TYPES OF TERMINAL EMULATION	NUMBER OF SYNCHRONOUS PORTS	NUMBER OF ASYNCHRONOUS PORTS	TRANSMISSION MODE	BIDIRECTIONAL	SPEED CONVERSION	MODE CONVERSION	INTERFACE CONVERSION	ON-BOARD PROCESSORS	OFFERS MENUS	SECURITY FEATURES	PRICE
Adacom Corp. (800) 227S-ADA	CP-150	SCS[1], DSC, ASCII	IBM PC, XT, AT and compatibles	IBM 3270	IBM 3287 printer	0	2	Coax to asynch ASCII	Yes	Yes	Yes	Yes	Yes	Yes	NP	$1,190
	Adaprint PC	SCS, DSC, ASCII	IBM PC, XT, AT and compatibles	IBM 3270	IBM 3287 printer	0	2	Coax to asynch ASCII	Yes	Yes	Yes	Yes	No	Yes	NP	$790
	CP-200	SCS, DSC, ASCII	IBM PC, XT, AT and compatibles with coax emulator boards	IBM 3270	None	0	1	Parallel ASCII	No	Yes	Yes	Yes	Yes	Yes	NP	$550
Apple Computer, Inc. (408) 996-1010	Appleline Protocol Converter	Coax RS-232 serial cable	Macintosh Lisa, Apple III	IBM 3274, 3276 controllers	IBM 3278 Model 2	NP	NP	Asynch	Yes	NP	NP	NP	NP	NP	NP	$1,295
ASC Computer Systems, Inc. (313) 779-8700	CS/70	SNA[1]	IBM PC and compatibles	IBM 3080 and 4300 series	IBM 3270	1 or 2	1 or 2	Synch	Yes	Optional	Optional	Yes	Yes	No	Optional	From $1,590
	CS/80	BSC[2]	IBM PC and compatibles, any asynch terminal	IBM 3080 and 4300 series, System/36, 38	IBM 3780	1 or 2	1 or 2	Bisynch, asynch	Yes	Optional	Yes	Yes	Yes	No	Optional	From $1,490
AT&T (800) 247-1212	AT&T 4251 Plus Protocol Converter	IBM 5250 SNA/SDLC[4]	Any ASCII device	IBM System/34, 36, 38	IBM 5250 SNA/SDLC	NP	4, 8, 16, 24 or 32	Synch, asynch	Yes	NP	NP	No	NP	Yes	Modem autocall-back, autologon, definable security password for control port	$3,875-$10,520
	AT&T 4271 Plus Protocol Converter	IBM 3270 BSC	Any ASCII device	Any IBM bisynch	IBM 3271 control unit, IBM 3277, 3278 terminals, IBM 3286 printers	NP	4, 8, 16, 24 or 32	Synch, asynch	Yes	NP	NP	No	NP	Yes	Modem autocall-back, autologon, definable security password for control port	$4,055-$10,795
	AT&T 4276 Plus Protocol Converter	SNA/SDLC	Any ASCII device	IBM 3705, 3725, 4331, 8100 front-end processor	IBM 3278 terminals, 3278 printers	NP	4, 8, 16, 24 or 32	Asynch	Yes	NP	NP	No	NP	Yes	Modem autocall-back, autologon, definable security password for control port	$3,875-$10,520
Atlantic Research Corp. (703) 644-9000	Xpert PC Card	X.25, X.3, X.28, X.29, DSP[6], QLLC[4], IBM 3780 BPAD[7]	IBM PC and compatibles	IBM PC and compatibles	IBM 3278 Model 2, 3279 Model 2, 3287, 3780; DEC VT100; ADM3	1	3	X.25 HDLC[8]	Yes	Yes	No	No	Yes	Yes	X.25 NUI, calling address insertion	$1,295
Avatar Technologies, Inc. (617) 435-6872	PA 100G	SNA/SDLC	IBM PC, XT, AT and compatibles	IBM 360, 370, 3080, 3090 series, 4300 series	IBM 3278 Models 2, 3, 4; IBM 3279 Models 2A, 2B, 3A, 3B	NA; IBM plug-in card	NA; IBM plug-in card	Coax Type A	Yes	NA	NA	NA	No	Yes	Password	$479
	PA 1000G	SNA/SDLC	Any supporting asynch communications	IBM 360, 370, 3080, 3090 series, 4368 series	IBM 3278 Model 2	NA	2	Asynch, Coax Type A	Yes	Yes	No	No	Yes	Yes	Password	$995
	Macroinframe DX	SNA/SDLC	Macintosh 512KE and higher models	IBM 360, 370, 3080, 3090 series, 4300 series	IBM 3278 Model 2	NA	2	Asynch, Coax Type A	Yes	Yes	No	No	Yes	Yes	Password	$1,195
Black Box Corp. (412) 746-5500	A/S-2G	BSC EBCDIC or BCD[9]; IBM 2770, 2780, 3741, 3780 over asynch ASCII in TTY format	Any with RS-232 port	Any IBM BSC host (360, 370, 4300 series)	NA	1	1	BSC, asynch	Yes	Yes	Yes	No	Yes	No	None	$1,195-$1,295
	BSC/SDLC Converter	IBM 3770 SDLC; 3780, 2780 BSC	Any with BSC	IBM running 3770 SNA, any on BSC	NP	2	NP	Synch	Yes	Yes	Yes	No	Yes	No	None	$1,625
	Unisys poll and select	Unisys poll and select	Any asynch ASCII	Unisys	None	1	1	Synch, asynch	Yes	Yes	Yes	Optional	Yes	Yes	None	$1,289
	Emulator	Twinax	IBM PC, XT, AT	IBM System/34, 36, 38	IBM 5250	0	1	Twinax	Yes	NA	Yes	Yes	Yes	Yes	NP	$845
	PQ-MP (Multiport Protocol Converter)	Twinax	Asynch terminals, micros and printers	IBM System/34, 36, 38	IBM 5250 printers	NA; 2 twinax	Up to 7	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	NP	$2,749
Comintex, Inc. (301) 721-3666	The CX-80 Data Exchange	SNA, SDLC, bisynch, X.25 (asynch and NCP Packet Switching Interface)	Any with DEC VT100 emulation or via Irma boards	IBM 3270	NA	2 or 4	5 to 45	Asynch, synch, Coax Type A	Yes	Yes	Yes	Yes	Yes	Yes	Password protection, access resource control and restriction	$3,995-$15,000
Computer Peripheral Systems, Inc. (404) 292-9965	Mars Jr.	Unisys poll and select	Any	Unisys A series, medium- and small-scale systems	Unisys ET-1100	1	1	Synch, asynch, TDI[10]	Yes	Yes	Yes	Yes	Yes	No	None	$795
	PC Companion	Unisys poll and select	IBM PC and compatibles	Unisys A series, medium- and small-scale systems	Unisys ET-1100	1	1	Synch, asynch, TDI	Yes	Yes	Yes	Yes	Yes	Yes	None	$240
Datagram Corp. (800) 235-5030	DM603TTY/ DM607TTY	Asynch ASCII, Unisys poll and select	Any	Unisys A series, medium- and small-scale systems	None	1	3 or 7	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$1,795-$3,495
Digital Communications Associates, Inc. (800) 241-4762 (404) 442-4500 (Ga.)	Protocol Processor II/ST	IBM 3270 BSC, SNA 3270, 5251 SNA	IBM PC, XT, AT; Macintosh	IBM 3080, 4300, 9370 series, System/36, 38	IBM 3278, 3279, 5251	6, 8, 10	6, 8, 10	Synch, asynch	Yes	Yes	NP	No	Yes	Yes	Dial-up	$5,995-$6,995
Fibronics International, Inc. (617) 778-0700	FC3001	IBM to RS-232	Any with RS-232 interface	IBM	DEC VT100 extended	0	1	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$800
IBM (Contact local IBM dealer)	IBM 5208 Model 1 ASCII 5250 Link Protocol Converter	SDLC, Twinax	NP	IBM System/36, 38	IBM 5250	1	7	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	NP	$3,295

[1]SNA character stream [2]IBM Systems Network Architecture [3]IBM Binary Synchronous Communications [4]Synchronous Data Link Control [5]Display System Protocol [6]Qualified Link-Level Control [7]Bisynchronous Packet Assembler/Disassembler [8]High-level data link control [9]Binary Coded Decimal [10]Burroughs Corp. Two-Wire Direct Interface [11]Airline line control [12]Transmission Control Protocol/Internet Protocol

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's product, this is designated NA (not applicable). Further product information is available from the vendors.

COMPANY	PRODUCT	PROTOCOLS SUPPORTED	MICROCOMPUTERS SUPPORTED	HOST SYSTEMS SUPPORTED	TYPES OF TERMINAL EMULATION	NUMBER OF SYNCHRONOUS PORTS	NUMBER OF ASYNCHRONOUS PORTS	TRANSMISSION MODE	BIDIRECTIONAL	SPEED CONVERSION	MODE CONVERSION	INTERFACE CONVERSION	ON-BOARD PROCESSORS	OFFERS MENUS	SECURITY FEATURES	PRICE
IBM (Contact local IBM dealer)	IBM 3708 Network Conversion Unit	SDLC asynch	IBM PC, PS/2	IBM 370, 9370, 4300 series, System/36, 38, 8100	IBM 3278, 3279 on Model 3274 Models 51C, 61C	1 or 2	8 or 9	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password protection, session termination or disconnect	$4,500
	IBM 3174 Subsystem Control Unit, Asynch Emulation Adapter	SDLC, BSC, asynch, channel attach	IBM PC, PS/2	IBM 370, 9370, 4300 series, System/36, 38, asynch	IBM 3270, 3101, DEC VT100	32	Up to 24	Synch, bisynch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password protection, session termination or disconnect	From $2,250
	IBM 9370 Information System, ASCII Subsystem Controller	Asynch	IBM PC, PS/2	IBM 9370	IBM 3270	0	16 per adapter	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	NP	$825 per card
	IBM 7171 ASCII Device Attachment Control Unit	Asynch	IBM PC, PS/2	IBM 370, 9370	IBM 3270, 3274 Model 10	0	16 to 64	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password protection, operation control	From $12,420
Innosys, Inc. (415) 769-7717	IC 100 series	SNA, BSC, asynch, X.25, ALC[1]	IBM PC and compatibles	All Tandem, Unisys, NCR, DEC, AT&T, HP mini- and mainframe-class CPUs	DEC VT100, IBM 3270, ASCII, ALC	1 to 4	1 to 4	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$12,500
Instrumentation Services, Inc. (612) 544-8916	ISI 87	Coax Type A	IBM PC and compatibles	IBM 3274 controller and compatibles	IBM 3287 printer	1	1	NP	No	Yes	Yes	NA	Yes	No	NP	$1,295
Integrated Design Engineering, Inc. (314) 343-0005	IDE Excel	NCR 301	IBM PC, XT, AT, 3390 workstation; NCR PC 6, 7, 8	NCR 8600	NCR 796-301; ADDS Viewpoint Plus	0	1 to 4	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	Multilevel security	$1,850
Interlink Technologies, Inc. (714) 639-1811	Matchmaker 2000, 3000, 4000	EBCDIC to ASCII	Any ASCII type	IBM System/36	IBM 3270	1	1	Synch, asynch	No	No	Yes	Yes	Yes	Yes	None	$795-$4,495
JBM Electronics Co. (314) 731-7781	MAPC-3270	IBM 3270 SNA/SDLC, BSC	IBM PC and compatibles	IBM	IBM 3270	1	Up to 16	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password, logon and logoff messages, dial-back security, inactivity timers	From $1,495
	MAPC-Tandem	NP	IBM PC and compatibles	Tandem	IBM 6530	1	16	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Dial-back security, password, logon and logoff messages	From $1,595
	MAPC-Univac	Universal Terminal System and Uniscope synch	IBM PC and compatibles	Univac	Universal Terminal System	1	16	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Dial-back security, password, logon and logoff messages	From $1,595
JDS Microprocessing Associates (800) 55-HYDRA (714) 770-2243 (Calif.)	Hyrda	Asynch, Channel Attach	Any ASCII type	IBM 360, 370, 4300, 3080, 3090 series	IBM 3270	0	4 to 64	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	Call-back, multilevel password, positive logoff	$4,900-$16,900
KMW Systems Corp. (512) 338-3660	Series II HASP	BSC	Apollo workstation	Mainframes running IBM protocols	IBM 360 RME workstation	1	Up to 8	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	From $4,595
	Series III Coax	SNA LU.1 or LU.2, BSC, DSC, SCS, Datastream	IBM PC and compatibles	IBM 3274, 3174, 3276 or compatibles	IBM 3278 printers	1	1	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$1,295
	Series III Twinax	IBM twinax	Macintosh, IBM PC and compatibles	IBM System/34, 36, 38	IBM 5291, 5251, 5225, 5256, 5219 printers	1	1	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$1,195
	Series II Twinax	IBM twinax	Macintosh, IBM PC and compatibles	IBM System/34, 36, 38	IBM 5291, 5251, 5225, 5256 printers	1	Up to 7	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$1,495-$3,595
	Series II 3770	SDLC	IBM PC and compatibles	Mainframes running IBM protocols	IBM 3776, 3777	1	Up to 8	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	From $4,595
	Series II 3270	SNA, SDLC, BSC	IBM PC and compatibles	Mainframes running IBM protocols	IBM 3278, BSC 3271, IBM 3278 printers	1	Up to 8	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	From $1,495
	Series II IBM 2780, 3780	BSC	IBM PC and compatibles	Mainframes running IBM protocols	IBM 2780 or 3780 RJE workstations	1	Up to 3	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	From $1,995
Lee Data Corp. (408) 986-8022	8000 series	SNA, SDLC, BSC	IBM PC and compatibles	IBM 4300, 3080, 3090 series	IBM 3270	32	32	Synch, asynch	Yes	Yes	Yes	Yes	No	NP	Multilevel password	$5,000-$10,000
Local Data, Inc. (213) 320-7126	Datalynx/3174	SNA, BSC, asynch	IBM PC and compatibles	IBM 370, 3080, 3090, 4300 series; any ASCII minicomputer	IBM 3278, 3279, 3178, 3179	2	4 to 32	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Inactivity timer for sessions, LU passwords	$3,000-$10,500
	Datalynx/3274	SNA, BSC	IBM PC and compatibles	IBM 370, 3080, 3090, 4300 series	IBM 3278, 3279, 3178, 3179	2	3 to 9	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Inactivity timer for sessions, LU passwords	$4,688-$9,375
	Datalynx/5251	SNA, asynch	IBM PC and compatibles	IBM System/34, 36, 38	IBM 5251 Model 12, 5294	2	3 to 9	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Inactivity timer for sessions, LU passwords	$3,000-$6,000
	Interlynx/5251	IBM twinax, asynch	IBM PC and compatibles	IBM System/34, 36, 38	IBM 5251 Model 11	1 twinax port	1 to 7	Twinax, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Passwords available for System/34, 36, 38 connection, reconnection, configuration	$1,595-$3,250
Micom Systems, Inc. (800) MICOM-US	MB3-SPC, MB3-BPC	BSC, SNA/SDLC	IBM PC and compatibles	Any supporting IBM 3270 protocol	IBM 3278 Model 2, 3279, 3278	1	4, 10 or 16	Synch, asynch	Yes	Yes	Yes	No	Yes	Yes	Logon and logoff messages, unload option, time-out disconnect, passwords	$2,885-$5,385
Modemaplus, Inc. (404) 458-2232 (ext. 12)	Snap	BSC, SNA	Any	Any	Any ASCII type	1	1	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$1,395-$1,625
	Microsnap	BSC, SNA	IBM PC and compatibles through 80386 type	Any IBM BSC or SNA system	NA; PC-specific	1	1	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	$995
NCR Comten (612) 638-7944	Comten Integrated Protocol Converter	Asynch passthrough, BSC 3270	Any with ASCII terminal emulation	IBM and compatibles	43 asynch terminals	1	32	Asynch RS-232	Yes	No	No	No	Yes	Yes	Password protection, IMS queue flushing, status queue on disconnect, inactivity time-out	$6,100-$15,450
Netlink, Inc. (919) 479-8612	SNAgate	SNA, SDLC	Any PC with DEC or IBM emulator	IBM running MVS or DOS	DEC VT100, VT220, IBM 3101, 3270/BSC cluster controller	Up to 8	Up to 16	Synch	Yes	Yes	Yes	No	Yes	Yes	Password	$4,000-$9,000

COMPANY	PRODUCT	PROTOCOLS SUPPORTED	MICROCOMPUTERS SUPPORTED	HOST SYSTEMS SUPPORTED	TYPES OF TERMINAL EMULATION	NUMBER OF SYNCHRONOUS PORTS	NUMBER OF ASYNCHRONOUS PORTS	TRANSMISSION MODE	BIDIRECTIONAL	SPEED CONVERSION	MODE CONVERSION	INTERFACE CONVERSION	ON-BOARD PROCESSORS	OFFERS MENUS	SECURITY FEATURES	PRICE
Packet/PC, Inc. (203) 875-1981	Packet/3270	SNA	IBM PC and compatibles	IBM systems running MVS/VM; System/36, 38, 9370	IBM 3270	NA; software only	NA; software only	Asynch	Yes	Yes	Yes	Yes	NA; software only	Yes	Optional data encryption and secure ID	$295
Patton Electronics Co. (301) 975-1000	Model 220 RS-232 to V.35 Converter	Transparent	Any using RS-232C or V.35	Any using RS-232C or V.35	NA	NA	2	Synch, full- or half-duplex data rates to 200K bit/sec.	Yes	No	No	Yes	No	No	None	$275
	Model 221 RS-232 to V.21 Converter	Transparent	Any using RS-232C or X.21	Any using RS-232C or X.21	NA	2	NA	Synch	Yes	No	No	Yes	No	No	None	$275
	Model 222 RS-232 to V.35 Converter	Transparent	Any using RS-232C or X.21	Any using RS-232C or X.21	NA	2	NA	Synch	Yes	No	No	Yes	No	No	None	$240
PCI, Inc., a Telesaction Co. (818) 880-4900	Smartnet Series 300	SNA	IBM PC, XT, AT and compatibles	IBM 360, 370 SNA with front-end NCP Packet Switching Interface	IBM 3274, 3276 controller	NP	NP	Asynch	Yes	Yes	NP	NP	NP	Yes	Autocallback for access control	NP
	Smartnet Series 200	SNA/SDLC, BSC	IBM PC and compatibles	IBM System/34, 36, 38	IBM 5250, 3278, 3270	NP	NP	Asynch, synch	Yes	Yes	Yes	Yes	NP	Yes	Autocallback, autologon, logoff	NP
Quasitronics, Inc. (800) 245-4192 (412) 745-2663 (Pa.)	Q-8000 series	HDLC/SDLC X.25, BSC, RS-232 asynch, Ethernet	Any supporting RS-232 asynch-remote port	Any supporting RS-232 asynch-remote port	None	2	8	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	None	NP
Remex Corp. (703) 491-3300	TMS-One	SNA/SDLC, BSC, asynch, X.25	Any	IBM 360, 370, 3080 series, 4300 series, IBM 8100	IBM 3274 Models 1C, 21C through 61C, 3767, 3270, 3290	2	Up to 32	Synch, bisynch, asynch, X.25	Yes	No	No	No	Yes	Yes	Control operator password protection, dial-back security for communications interface	$7,495-$13,745
Rolm Corp. (408) 986-1000	Reimbridge 5250 Link Protocol Converter	IBM 5250 twinax	IBM PC, XT, AT and compatibles, PS/2	IBM System/36, 38; IBM 5294 Remote Control Unit	IBM 5291 display; IBM 5256 printer	NA	7 per twinax attachment; 2 attachments per CBX card set	Asynch	Yes	Yes	No	Yes	Yes	Yes	Automatic lockout, power-on self test, password protection	NP
Sytek, Inc. (415) 966-7414	8200, 8050, 8080	TCP/IP[23], Syconnect, Netware, Decnet, Xerox Network Systems	IBM PC, XT, AT and compatibles; Apple	Any ASCII or IBM host	Any ASCII, any IBM 3270 Coax Type A	NA	Up to 10,000 across network	Asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password protection, access control, data encryption	$5,000-$9,500
3Com Corp. (800) NET-3COM (408) 562-6400 (Calif.)	CS/1-SNA	SDLC/3270	Any	IBM 370 and compatibles	NP	1	Up to 48	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	User access control, dedicated and pooled LUs	$11,500
TOPS, a Sun Microsystems, Inc. company (415) 549-5900	Tops Flashcard	Appletalk	IBM PC, XT, AT and compatibles running DOS	NA; distributed file network	NP	0	0	Fiber-optics, twisted-pair, Appletalk cabling	Yes	Yes	NA	Yes	Yes	Yes	Password, read-only/write-only	$200-$500
Tri-Data Systems, Inc. (408) 746-2900	Netway 1000	BSC, SNA	Macintosh, IBM PCs on Appletalk or Phonenet	IBM mainframes with 3270 architecture	IBM 3278	1	0	Synch	Yes	Yes	NA	NA	Yes	Yes	Password connect special workstation to special LU	$3,195
	Netway 1500	BSC, SNA, SDLC, Unisys poll and select, ASCII point-to-point, EBCDIC, EBCDIC BCD, others	Any	Any using aforementioned protocols with lines to 56K	DEC VT100, IBM 3270, SSI interface	4	Up to 128	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password security	$800-$1,000 per user
Wall Data, Inc. (800) 433-3368 (206) 883-4777 (Wash.)	DCF II Models 6, 10, 18	SNA, SDLC, BSC (3270), 5250 (SNA)	Any PC running MS-DOS	IBM System/36, 38, IBM 360, 370	IBM 5250, 3270	1 to 5	6, 10 or 18 per box	Synch, asynch	Yes	Yes	Yes	No	Yes	Yes	Optional dial-back mode	$3,995-$5,995
	Datagate/PC	SNA, SDLC, BSC (3270), 5250 (SNA)	IBM PC, XT, AT and clones	IBM System/36, 38, 360, 370	IBM 5250, 3270	3 or 5 ports per card	1 to 5 per card	Synch, asynch	Yes	Yes	Yes	No	Yes	Yes	Optional dial-back mode	$1,595-$1,995
Winterhalter, Inc. (313) 662-2002	Datatalker	3270/BSC, 3270/SNA, 3780/BSC	IBM PC and compatibles under MS-DOS or Unix, IBM PS/2	Any IBM 3270-based architecture	IBM 3278, 3279	1	1 to 8	Synch	Yes	No	Yes	Yes	Yes	Yes	None	$895-$2,395
Xitron, Inc. (313) 971-8530	Universal Interface	All except SDLC	Any	Any	IBM 3270, 2780, any ASCII	0	4	Synch, asynch	No	Yes	Yes	Yes	Yes	No	None	$3,250-$6,050
	KM1E Interface	All except SDLC	Any	Any	IBM 3270, 2780, any ASCII	0	12	Synch, asynch	Yes	Yes	Yes	Yes	Yes	Yes	Password	$7,800-$14,500

Link software

FROM PAGE S10

asynchronous file transfer between IBM PCs and compatibles and an IBM host using VM/CMS, TSO or CICS.

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(800) 225-8590
Add-a-Terminal
For IBM PCs, PC XTs, ATs and compatibles and the Personal System/2. Provides a library of 50 terminal emulation models in both IBM PC-DOS and OS/2 versions. Provides a virtual console facility to aid the migration process of mini and mainframe applications to the PC environment.

Software AG of North America, Inc.
(800) 843-9534
Natural/Connection Version 2
Facilitates sharing of both micro and mainframe resources. Runs on IBM's PC in conjunction with Software AG's Natural on a host mainframe.

Spectrum Concepts, Inc.
(212) 766-4400
XCom 6.2
Uses LU6.2 and IBM Advanced Program-to-Program Communications for transferring data between IBM mainframes, System/34, 36 and 38 machines or the Digital Equipment Corp. VAX and the IBM PC and compatibles environment.

SPSS, Inc.
(312) 329-3405
SPSS-X, SPSS/PC Plus Version 2.0
Data analysis software enabling users to send files between IBM PCs and compatibles and IBM systems running CMS and MVS, Digital Equipment Corp. VAX/VMS or Unix systems via the Kermit communications protocol.

Sterling Software, Inc.
Answer Systems Division
(818) 716-1616
Micro/Answer
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Systems Center, Inc.
(800) 292-0104
NDM-PC
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Tesseract Corp.
(415) 543-9320
IDL
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Tri-Data Systems, Inc.
(408) 746-2900
Netway 1000A
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Ungermann-Bass, Inc.
(408) 496-0111
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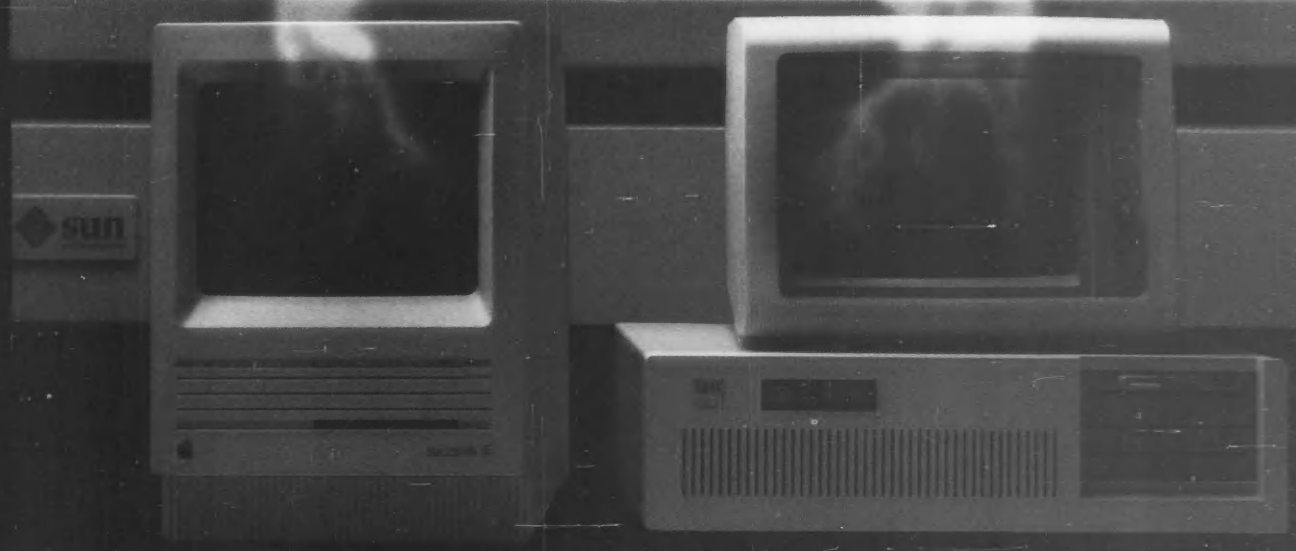

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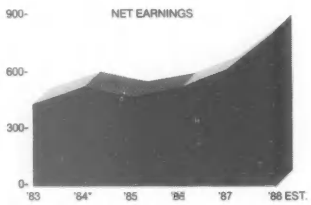

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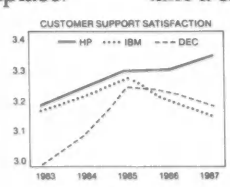

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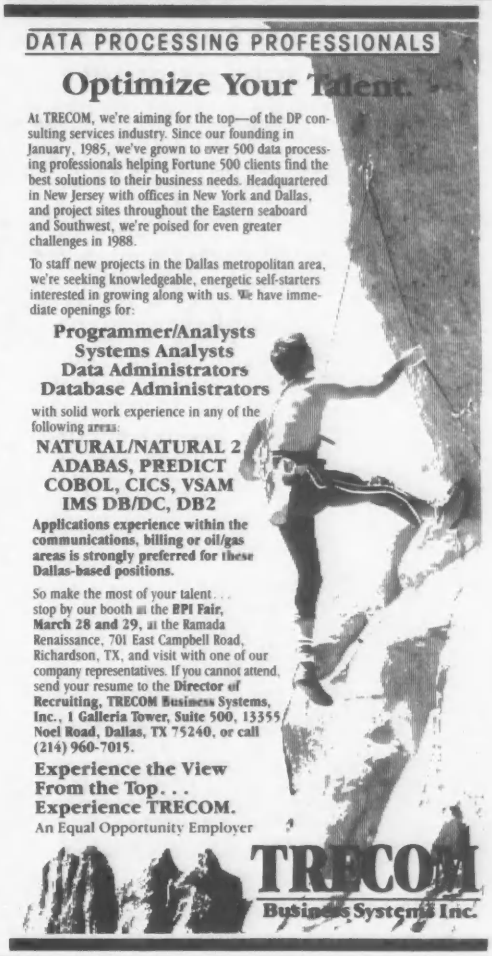

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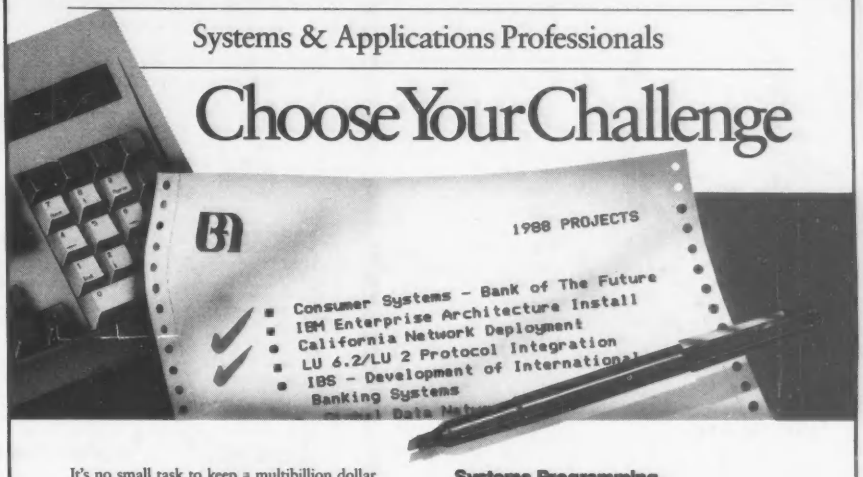
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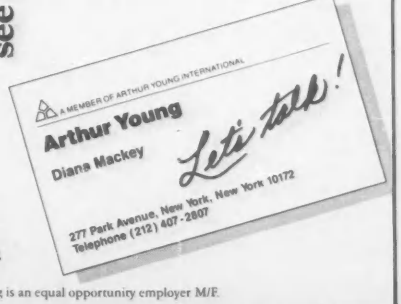

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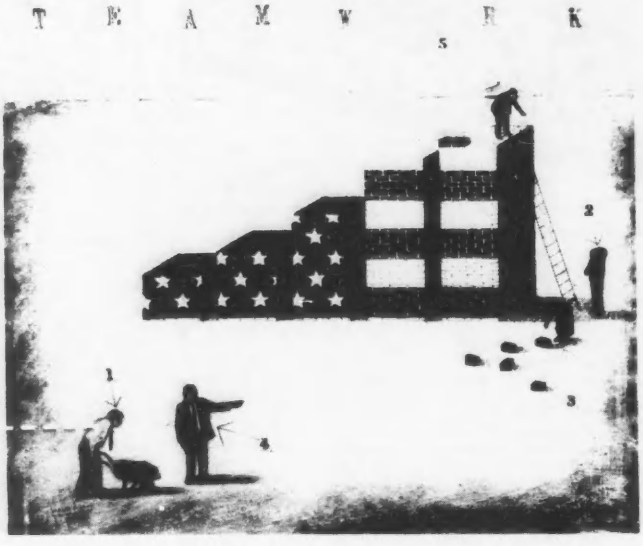

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MARKETPLACE

Rumors sour Apple market

Uncertainty about discontinuation of Mac Plus keeps buyers away

BY CAMERON HALL
BOSTON COMPUTER EXCHANGE CORP.

The upbeat mood of the market the week of March 11 has been lost amid uncertainty and falling prices in the Apple Computer, Inc. Macintosh market. Rumors of the discontinuation of the Macintosh Plus worked to lower the machine's prices, and the availability of Macintosh SE upgrades kept buyers on the sidelines as prices kept dropping.

Micro managers with older Macintosh models and retail chains with new inventory were both coming into the market to sell. "Sliding down" was the phrase used to describe the bids one corporate seller got as he offered many Mac Plus machines for a quick sale. His hopes for cash to purchase Mac SE upgrades faded as many sellers offered their Mac Pluses in a buyer's market. The trading motto for the week was "Sell low before you have to sell lower."

Traders in the IBM market were still looking for the IBM Personal Computer AT Model 339s and IBM XT 089s that were rumored to be in the West and the Midwest. It turned out that they were not True Blue models at all.

The purchasing agent for a large value-added reseller with government and Fortune 100 clients footnoted her frustrated search for machines by saying, "Ninety-five percent of my clients are only interested in discontinued IBM and Compaq models."

AT still machine of choice

Major consulting groups say the machine of choice for the average corporate user is still the PC AT: It is fast enough for today and allows users to keep the OS/2 — IBM and Microsoft Corp.'s next-generation operating system — option open for later developments.

The question in the minds of most confused IBM micro buyers is whether there really will be applications that make it worthwhile to switch to the hardware of IBM's Personal System/2.

Most word processing workers and spreadsheet users are asking, Do I really need to multitask when I can really only do one thing at a time?

On the IBM floor, the AT Model 339 closed down $150, at $3,300. Also down for the week ended March 18 was the AT Model 099, which closed at $2,400. PC XT machines traded steadily all week: The XT Model 089 was down $175, to $1,625, after previous pressure on prices brought sellers to the market. The XT Model 086 closed at $1,300 under favorable supply conditions, and the XT Model 3270 was changing hands at $1,400. The standard of standards for all users, the IBM PC, was down $75 to $850.

Business as usual

The Compaq Computer Corp. market was strong all week. Steady demand continues for these machines, which have not made their users face the OS/2 dilemma.

The original Portable I closed at $850, up from the previous week's $800, while the Portable II system with a 20-MHz drive closed at $2,150. The Deskpro 286 closed up $75 at $2,475 as buyers switched from the higher priced IBM AT Model 239.

In the Macintosh market, new Mac SE equipment was discounted as low as $2,200, which drove prices of the used equipment down $50 to $1,800 by week's end. The Mac Plus supply dropped to the recent low of $1,250, and the 512E was also down slightly, at $1,000. The Mac II market remained at $4,000 in light trading.

The Boston Computer Exchange can be reached at 800-BOCOEXX or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending March 18, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$850	$925	$650
XT Model 086	$1,300	$1,425	$1,150
XT Model 089	$1,625	$1,800	$1,500
XT Model 3270	$1,400	$1,500	$1,000
AT Model 099	$2,400	$2,450	$1,950
AT Model 239	$2,750	$2,750	$2,650
AT Model 339	$3,300	$3,450	$3,200
Compaq Portable I	$850	$925	$750
Portable II	$2,150	$2,250	$1,825
Portable III	$2,725	$3,000	$2,475
Plus	$1,350	$1,400	$1,275
Deskpro Model 2	$1,600	$1,800	$1,600
Deskpro 286	$2,475	$2,475	$2,050
Deskpro 386	$4,000	$4,000	$3,600
Apple Macintosh 512E	$1,000	$1,075	$800
Plus	$1,250	$1,300	$1,100
SE	$1,800	$2,200	$1,800
II	$4,000	$4,200	$3,500
AT&T 3B2	$4,500	$4,500	$3,500
DEC Rainbow 100+	$600	$750	$600
Hewlett-Packard Laserjet	$875	$950	$600

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Users seem eager to follow DEC growth path

BY KARLYN KILROY
IDC FINANCIAL SERVICES CORP.

The Digital Equipment Corp. marketplace has been fairly active recently. It seems as though more and more users are getting involved with DEC equipment. This is a result of DEC voicing its future plans and reassuring users that it will continue to provide new growth paths for them. DEC has done this by introducing products with better price/performance than had previously been offered.

Although activity in the secondary market has increased, it appears that DEC is trying to obtain every possible sale.

According to industry sources, whenever DEC hears of a deal, it underbids dealers by as much as it has to to win the deal. Although this is not favorable for dealers and lessors, it results in DEC having a sale and the end user receiving a better deal.

Current fair market values for DEC's VAX 11/730, 11/750 and 11/780 lines have been decreasing gradually, with the exception of the 11/785.

According to third-party lessors, the 11/785 has risen approximately $20,000 in the past several months as a result of supply drying up. Unless demand for these machines subsides or supply is replenished, these values could rise slightly higher in the near future.

In December 1987, IDC Financial Services Corp. said the VAX 11/785s were trading at a retail current fair market value of 30% of list price. As of last week, the 11/785s were trading at a retail current fair market value of 38%.

Microvax II in demand

According to current fair market value calls, DEC's Microvax II is still a very viable product. Overall, values of this machine have held fairly stable during the past year, with the retail current fair market value at 70%.

Third-party lessors have reported that demand for Microvax IIs is high and that they are able to move a Microvax II out as soon as they get one in.

At one point, DEC had increased the VMS license on the Microvax II to try to encourage users to migrate to the low end of the 8000 line rather than purchase a Microvax II. According to how well the market has held up, it appears that this move had no effect on sales of the Microvax II.

Mid-life kickers

DEC's recent announcement of the 8800 series consisted of mid-life kickers to the 8700 and 8800 processors. The new models — the 8810, 8820, 8830, 8840 and 8842 — provide a new growth path for current 8000 users.

The 8810 replaced the current 8700 and features the same performance, pricing and hardware as the older model. On the other hand, the 8820, 8830 and 8840 are enhanced versions that offer better price/performance. In addition, the Model 8842 is a preconfigured cluster of two 8820s. All of the 8800 series processors feature the new symmetric multiprocessing capability.

As expected, this new 8800 series is based on the 8700 processor and is scheduled to ship immediately.

In general, the 8000 models are beginning to trade on the used market. It is likely that this announcement will cause secondary market activity to pick up even more, since DEC has provided a new growth path for users.

Going down

Current fair market values for the 8200s and 8250s are declining. Currently, indications from the DEC market are that the introduction of the Microvax 3500 and 3600 will make the Microvax 8200 and 8250 processors obsolete.

Although the Microvax 3500 and 3600 have not yet begun shipping in volume and probably will not until this summer, they have already begun to impact the low end of the 8000 line.

Two of the more popular models within the 8000 line are the 8600 and 8650. Even though they are the oldest in the line, values on these models seem to have held up fairly well. Since they are based on the older Unibus architecture, they can use the same peripherals as the VAX 11/730, 11/750, 11/780, 11/782 and 11/785. Other models that have begun to trade are the Microvax 8550s and 8700s.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc at 617-872-8200.

DEC processors

Current retail fair market value

	Date shipped	List price	Percent of list price
VAX 11/785	June 1984	$200,000	38%
Microvax II	May 1985	$25,000	70%
VAX 8600	April 1985	$469,875	70%
VAX 8650	April 1986	$522,375	73%

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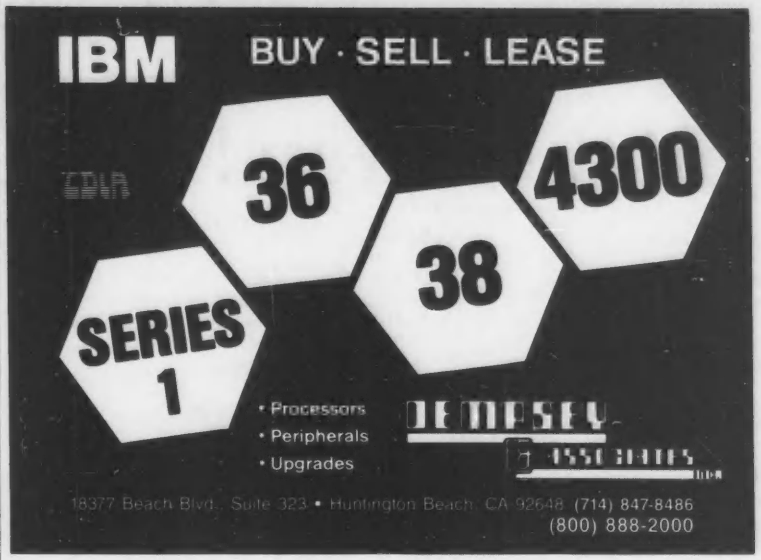

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S/38-300	0.58	6 to 8
S/38-400	0.75	6 to 8
4341-1	0.88	2 to 4
S/38-500	0.96	8 to 16
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•9375-60	1.2	8 to 16
4361-11	1.4	4 to 16
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4381-1	2.1	4 to 16
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3083EX	4.4	8 to 32
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•3090-120E	7.5	32 to 128
†4381-24	7.8	16 to 64
3083JX	9.0	8 to 32
3090-400	9.2	32 to 64
3081D	10.6	16 to 32
•3090-150E	10.0	32 to 64
3081GX	13.9	16 to 64
3090-180	15.4	32 to 64
3081KX	16.5	16 to 64
•3090-180E	17.8	32 to 64
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3084QX	28.7	32 to 128
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5870	26.0	32 to 128
5880	38.6	32 to 256
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AS XL-80	50	64 to 256
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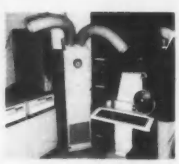

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SPECIAL TO CW

When asked to plan or provide training for your corporation, how do you determine the most efficient and effective approach? Choosing between live instructors and computer-based training (CBT) will depend on your audience and the subject matter, according to experts.

In addressing technology issues, instructor-led training is a must for beginners, even if they are self-starters, according to Karen Sanders, manager of personnel development at Maritz, Inc. in St. Louis. These students need information on how to learn about computing. "When left to their own devices, they will quite often give up before getting anywhere because they 'don't know what they don't know,' " Sanders says.

Working with a partner, in addition to the instructor, often helps neophytes vent frustration and get questions answered, Sanders says.

The more experienced students — ones at a "technical level above ground floor" — will find CBT a valuable vehicle for filling in gaps in their knowledge, Sanders says.

The ability to jump forward in the program and to review when necessary allows the students to acquire specific pieces of information in a convenient and timely way.

According to Sanders, some exposure to the instructional materials prior to class will help students formulate concepts.

The appropriate medium can also vary with the nature of the subject material, according to Robert Rouse, assistant dean of the School of Technology and Information Management at Washington University in St. Louis.

"If you are looking to affect attitudes and judgment, use an instructor. If you are merely passing data, [CBT] is sufficient," Rouse says.

Joseph E. Wehr, president of Data Base Management, Inc., a Manchester, Conn.-based provider of training and consulting services, believes instructor-led classes are most appropriate for materials that are "subjective, qualitative or require value judgment."

He regards CBT as a primary vehicle for presenting structured or quantitative materials. "It is most effective when the student can view three or four screens and then is forced to respond," he adds.

Wehr says that CBT can effectively complement instructor-led classes; it can be used as a follow-up for testing retention. According to Rouse, machine-based instruction can be enhanced by the availability of an informed professional to answer questions by telephone.

Although approaches to training and education vary, professionals agree that automated training tools will never completely replace instructors in the classroom. But the automated tools offer value in providing flexibility in the presentation of repetitive materials, follow-up and review and personally paced study.

Taylor is an associate with the Center for the Study of Data Processing at Washington University in St. Louis.

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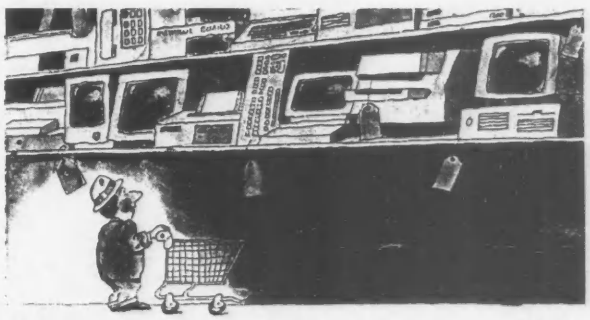

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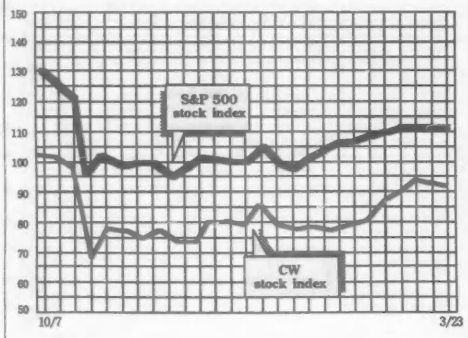

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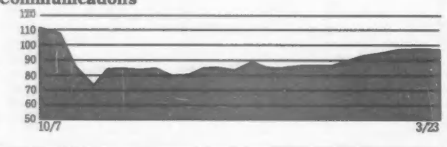

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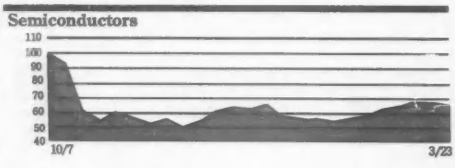
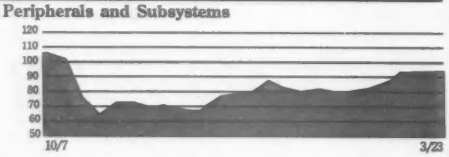
Software and DP Services

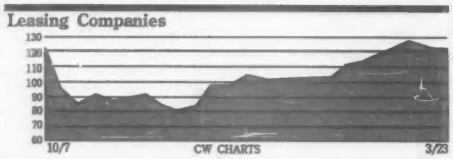
Semiconductors



Peripherals and Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 23, 1988

E X C H		52-WEEK RANGE (1)		PRICE CLOSE MARCH 23 1988	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	100	74	91.63	-2.4	-2.5
Q	ANDREW CORP	19	11	15.25	0.3	1.7
Q	ARTEL COMM CORP	3	2	2.00	-0.3	-11.1
N	AT&T	36	20	28.25	-0.5	-1.7
Q	AVANT GARDE COMP INC	6	2	1.88	0.2	11.1
Q	AVANTEK INC	17	6	7.38	-0.1	-1.7
N	AYDIN CORP	38	16	25.50	2.1	9.1
N	BELL ATLANTIC CORP	80	61	70.00	-1.3	-1.8
N	BELLSOUTH CORP	44	29	40.00	-0.1	-0.3
Q	COMPRESSION LABS INC	7	2	3.25	-0.1	-3.7
O	COMPUTER NETWORK TECH	6	1	1.41	0.0	0.0
O	CONTEL CORP	40	25	32.13	-1.3	-3.7
Q	DATA SWITCH CORP	10	4	8.63	0.0	0.0
Q	DIGITAL COMM ASSOC	49	20	34.38	0.3	0.7
Q	DYNATECH CORP	36	14	23.25	-0.5	-2.1
Q	FIBRONICS INTERNATIONAL INC	8	2	4.50	0.3	5.9
Q	GANDALF TECHNOLOGIES	11	5	7.00	-0.4	-5.1
Q	GENERAL DATACOMM INDS	14	3	3.75	-0.6	-14.3
N	GTE CORP	45	29	38.00	-0.5	-1.3
Q	INFOTRON SYS CORP	12	5	8.75	-0.3	-2.8
N	ITT CORP	66	42	46.38	0.1	0.3
N	MA/COM INC	16	7	11.00	0.5	4.8
Q	MCI COMMUNICATIONS CORP	12	6	11.13	0.0	0.0
Q	MICOM SYS INC	17	7	12.50	0.6	5.3
Q	NETWORK SYS CORP	18	7	8.88	-0.3	-2.7
N	NORTHERN TELECOM LTD	24	14	20.13	0.9	4.5
Q	NOVELL INC	30	12	23.00	0.3	1.1
N	NYNEX CORP	78	58	66.38	-2.6	-3.8
N	PACIFIC TELESIS GROUP	34	9	29.38	-0.1	-0.4
Q	PARADYNE CORP	9	4	5.38	0.0	0.0
A	PENRIL CORP	6	1	4.13	0.0	0.0
N	PLESSEY PLC	41	23	29.50	0.3	0.9
N	SCIENTIFIC ATLANTA INC	20	8	15.38	-0.5	-3.1
N	SOUTHWESTERN BELL CORP	46	22	37.50	-0.4	-1.0
Q	3COM CORP	26	12	21.38	-1.4	-6.0
N	TIMEPLEX INC	40	17	32.30	0.0	0.2
Q	UNGERMANN BASS INC	16	5	12.25	-0.1	-1.0
N	U S WEST INC	60	43	53.75	-0.3	-0.5
	Computer Systems					
Q	ALLIANT COMPUTER SYS	36	5	7.88	-0.1	-1.6
Q	ALPHA MICROSYSTEMS	6	3	4.50	0.2	4.3
Q	ALTOS COMPUTER SYS	15	9	10.50	-0.6	-5.6
A	AMDAHL CORP	50	19	34.38	-2.6	-7.1
Q	APOLLO COMPUTER INC	25	9	15.13	-0.4	-2.4
Q	APPLE COMPUTER INC	60	28	42.50	-3.6	-7.9
N	BOLT BERANEK & NEWMAN	28	12	17.25	2.0	13.1
Q	BRITTON LEE INC	5	1	2.38	0.0	0.0
N	COMPAQ COMPUTER CORP	79	26	51.50	-2.0	-3.7
Q	COMPUTER AUTOMATION INC	17	5	9.63	-0.9	-8.3
A	COMPUTER CONSOLES INC	11	2	5.25	0.1	2.4
Q	CONCURRENT COMP CORP	24	11	17.25	0.5	3.0
N	CONTROL DATA CORP DEL	38	18	27.88	-0.6	-2.2
Q	CONVERGENT TECH	11	3	3.44	-0.1	-3.5
Q	CONVEX COMPUTER CORP	22	6	8.00	-0.6	-7.2
N	CRAY RESH INC	136	47	79.50	-3.5	-4.2
N	DAISY SYS CORP	11	5	7.75	-0.9	-10.1
N	DATA GEN CORP	37	16	23.88	-1.0	-4.0
N	DATAPOINT CORP	9	3	4.38	0.0	0.0
N	DIGITAL EQUIP CORP	200	110	111.38	-6.3	-5.3
N	FLOATING POINT SYS INC	15	3	5.13	0.4	7.9
N	GOULD INC	34	8	12.88	0.4	3.0
N	HARRIS CORP	43	22	31.75	1.9	6.3
N	HEWLETT PACKARD CO	74	36	62.50	-2.5	-3.8
N	HONEYWELL INC	91	49	67.13	0.4	0.6
N	IBM	176	102	111.63	-3.6	-3.1
Q	INFORMATION INTL INC	16	9	13.00	0.8	6.1
Q	IPL SYS INC	3	1	1.75	-0.1	-6.7
Q	MASS COMPUTER CORP	14	4	4.50	-0.3	-5.3
N	MATSUSHITA ELEC INDL LTD	213	93	212.75	6.3	3.0
Q	MEGADATA CORP	6	3	3.38	-0.4	-10.0
Q	MENTOR GRAPHICS CORP	39	14	26.38	-0.6	-2.3
N	NBI INC	14	4	6.88	0.3	3.8
N	NCR CORP	87	50	59.00	-1.9	-3.1
N	PRIME COMPUTER INC	31	12	17.25	0.4	2.2
Q	PYRAMID TECHNOLOGY	12	5	11.25	0.3	2.3
Q	STRATUS COMPUTER	41	15	26.50	-2.5	-8.6
Q	SUN MICROSYSTEM INC	46	14	36.88	2.3	6.5
Q	SYMBOLICS INC	6	1	1.38	0.0	0.0
N	TANDEM COMPUTERS INC	38	17	18.63	-2.0	-9.7
N	TANDY CORP	57	28	41.63	0.4	0.9
N	ULTIMATE CORP	37	13	14.38	-0.9	-5.7
N	UNISYS CORP	48	24	32.75	-1.8	-5.1
A	WANG LABS INC	19	10	12.13	-0.8	-5.8
	Software & DP Services					
Q	ADVANCED COMP TECH	6	1	1.75	-0.1	-6.7
N	AGS COMPUTERS INC	30	11	18.38	0.4	2.1
Q	AMERICAN MGMT SYS INC	20	9	16.25	0.1	0.8
Q	AMERICAN SOFTWARE INC	22	6	13.38	0.4	2.9
N	ANACOMP INC	11	4	9.00	0.5	5.9
Q	ANALYSTS INTL CORP	10	4	7.75	0.4	5.1
Q	ASHTON TATE	33	13	29.00	-1.5	-4.9
Q	ASK COMPUTER SYS INC	16	6	13.13	-0.4	-2.8
Q	AUTODESK INC	34	12	24.75	-0.3	-1.0
N	AUTO DATA PROCESSING	55	16	44.25	-1.0	-2.2
Q	BOOLE & BABBAGE INC	12	5	8.25	0.0	0.0
N	COMPUTER ASSOC INTL INC	37	15	27.75	-2.9	-9.4
Q	COMPUTER HORIZONS CORP	15	7	9.88	0.0	0.0
N	COMPUTER SCIENCES CORP	73	42	48.63	-0.4	-0.8
N	COMPUTER TASK GROUP INC	17	9	11.13	0.1	1.1
Q	COMSHARE INC	28	12	17.00	0.4	2.3
N	CULLINET SOFTWARE INC	14	4	7.50	0.0	0.0
Q	CYCARE SYS INC	10	6	7.88	0.0	0.0
Q	DUQUESNE SYS INC	33	10	20.25	0.0	0.0
A	DATA ARCHITECTS INC	17	7	13.63	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	40.13	-2.0	-4.7
Q	HOGAN SYS INC	17	5	5.25	-0.1	-2.3
Q	INFORMIX CORP	31	12	19.50	-1.8	-8.2
Q	INTELLICORP INC	11	2	3.38	-0.4	-10.0
Q	KEANE INC	10	6	9.00	0.0	0.0
Q	LOTUS DEV CORP	40	19	25.25	-5.8	-18.5
Q	MANAGEMENT SCI AMER	19	6	6.50	-0.4	-5.5
Q	MICRO PRO INTL CORP	8	3	3.38	-0.1	-3.6
Q	MICROSOFT CORP	79	37	59.00	-5.8	-8.9
Q	MORINO ASSOCIATES INC	24	7	16	0.8	4.8
Q	NATIONAL DATA CORP	34	19	31.00	0.0	0.0
Q	ON LINE SOFTWARE INTL INC	22	9	13.13	-0.5	-3.7
Q	ORACLE SYS CORP	19	8	16.00	-0.5	-3.0
N	PANSOPHIC SYS INC	28	11	17.63	0.1	0.7
Q	POLICY MGMT SYS CORP	30	15	24.25	-0.8	-3.0
Q	PROGRAMMING & SYS INC	14	7	11.50	-1.0	-8.0
Q	REYNOLDS & REYNOLDS CO	39	14	21.50	0.0	0.0
Q	SEI CORP	18	10	17.25	0.4	2.2
Q	SHARED MED SYS CORP	37	19	25.13	-0.4	-1.5
Q	SOFTWARE AG SYSTEMS INC	14	7	11.38	0.1	1.1
Q	SOFTWARE PUBG CORP	17	5	13.75	0.0	0.0
A	STERLING SOFTWARE INC	13	6	8.38	0.0	0.0
Q	SUNGARD DATA SYS INC	21	10	17.25	0.8	4.5
Q	SYSTEMATICS INC	32	19	31.75	1.0	3.3
N	SYS. SOFT INC.	24	7	16	-1.5	-8.7
Q	VM SOFTWARE INC	45	7	12.75	-1.0	-7.3
	Semiconductors					
N	ADV MICRO DEVICES INC	25	8	12.25	0.0	0.0
N	ANALOG DEVICES INC	24	8	14.38	-0.6	-4.2
Q	ANALOGIC CORP	13	5	7.00	-0.5	-6.7
Q	INTEL CORP	42	18	31.75	0.8	2.4
Q	LSI LOGIC CORP	17	7	9.75	-0.6	-6.0
N	MOTOROLA INC	74	35	46.38	-0.8	-1.6
N	NATL SEMICONDUCTOR	22	10	12.38	0.6	5.3
N	TEXAS INSTRS INC	80	36	50.38	-4.9	-8.8
A	WESTERN DIGITAL CORP	33	11	16.75	0.8	4.7
	Peripherals					
Q	ALLOY COMP.	13	3	3.63	-0.9	-19.4
N	AM INTL INC	9	3	4.25	-0.1	-2.9
Q	AST RESH INC	21	6	9.25	-1.0	-9.8
Q	AUTO TROL TECH CORP	9	3	5.25	-0.3	-4.5
Q	BANCTEC INC	16	5	8.75	1.0	12.9
Q	CIPHER DATA PRODS INC	16	4	9.00	0.1	1.4
A	COGNITRONICS CORP	5	2	3.63	0.1	3.6
N	COMPUGRAPHIC CORP	28	19	25.88	0.0	0.0
N	COMPUTERVISION CORP	20	7	7.00	0.0	0.0
A	DATAPRODUCTS CORP	24	7	9.50	-0.6	-6.2
A	DATARAM CORP	8	5	6.38	0.0	0.0
N	DECISION INDS CORP	13	4	10.75	0.0	0.0
N	EASTMAN KODAK CO	71	40	41.75	-1.3	-2.9
Q	E M C CORP MASS	29	10	17.00	0.0	0.0
Q	EMULEX CORP	9	4	7.94	-0.3	-3.8
Q	EVANS & SUTHERLAND	38	18	20.00	0.3	1.3
Q	ICOT CORP	13	3	5.00	0.0	0.0
Q	INTERLEAF INC	24	11	19.50	-1.0	-4.9
Q	IOMEGA CORP	5	1	3.50	0.7	24.4
Q	LEE DATA CORP	9	3	3.75	-0.1	-3.2
Q	MASSTOR SYS CORP	6	1	2.88	0.4	15.0
Q	MAXTOR CORP	33	6	14.00	-0.5	-3.4
Q	MICROPOLIS CORP	44	13	26.50	-0.5	-1.9
Q	MINISCRIBE CORP	18	5	10.88	0.3	2.4
N	MINNESOTA MNG & MFG CO	84	45	62.00	-1.1	-1.8
A	MSI DATA CORP	29	12	26.75	-0.3	-0.9
Q	PRIAM CORP	6	1	2.13	0.1	6.3
Q	PRINTRONIX INC	13	7	9.63	-0.3	-2.5
N	QMS INC	27	8	11.75	0.0	0.0
Q	QUANTUM CORP	32	8	12.00	-0.8	-5.9
Q	RAMTEK CORP	6	2	3.50	-0.5	-12.5
N	RECOGNITION EQUIP INC	22	7	9.38	0.1	1.4
Q	REXON INC	14	5	7.88	-0.5	-6.0
Q	SCAN TRON CORP	14	7	12.50	-0.8	-5.7
Q	SEAGATE TECHNOLOGY	46	10	22.00	-0.3	-1.1
N	STORAGE TECH CORP	5	1	1.88	0.0	0.0
Q	TANDON CORP	7	1	2.13	0.3	13.3
A	TEC INC	7	3	5.13	0.1	2.5
N	TEKTRONIX INC	41	21	29.75	1.0	3.5
Q	TELEVIDEO SYS INC	3	1	1.19	0.1	5.6
N	TELEX CORP	94	30	50.00	-0.6	-1.2
Q	WYSE TECH	40	11	19.63	-1.4	-6.5
N	XEROX CORP	85	50	56.13	-0.8	-1.3
Q	XIDEX CORP	16	6	6.13	-0.1	-2.0
	Leasing Companies					
Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	5.63	-0.1	-2.2
N	COMDISCO INC	37	12	22.38	-0.1	-0.6
N	CONTINENTAL INFO SYS	14	5	8.25	-0.6	-7.0
Q	PHOENIX AMERN INC	6	2	3.13	0.1	4.2
Q	SELECTERM INC	6	3	3.75	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Losing wait

Delay of 1-2-3 sinks Lotus; Apple suit hurts all involved

The stock market does not take kindly to product delays, and Lotus Development Corp. realized that in a big way last week. After pushing back the delivery date of a 1-2-3 upgrade from the second to the fourth quarter, Lotus plunged 3½ points Wednesday and finished at 24¼ as of Thursday's close, off 5¾ points from a week earlier. In a way, the drop was indicative of the bruisings computer issues took in a market that wandered aimlessly before taking a sharp slide on Thursday when the dollar plunged.

Wall Street also did not deal softly with Apple Computer, Inc.'s suit charging Microsoft Corp. and Hewlett-Packard Co. with copyright infringements. All three fell: Apple dropped 3⅞ points to 40⅞; Microsoft was off 1¾ points to 56½; and HP slipped 1⅛ points to 60¾.

Other companies hit hard in the four days of trading included IBM, down 4½ points to 109¾; Cray Research, Inc., off 3¾ points to 78; 3Com Corp., down 3¼ points to 20⅜; Compaq Computer Corp., down 3⅛ points to 50⅛; and Digital Equipment Corp., which hit a point even lower than after October's crash, when it dropped 3⅛ points to 107⅝.

JAMES DALY

DG changes style, pins hopes on telecom

BY ELISABETH HORWITT
CW STAFF

WESTBORO, Mass. — After being lambasted by DEC in the Fortune 2,000 market, pummeled by layoffs and facing a $71 million net loss in fiscal 1987, Data General Corp. is gearing up for a new market reincarnation as a telecommunications vendor.

The company has spent the last 2½ years hiring, acquiring and allying with the telecommunications expertise and marketing presence it needs. But DG still may have started too late to establish itself as a major telecommunications player — especially against the aggressive telecommunications strategies of giant rivals IBM and Digital Equipment Corp.

The linchpins of DG's new strategy will be two new products that combine the intelligence of DG hosts with voice/data switching capabilities.

The products, expected to be introduced within the next year and a half, are the Integrated Office Controller (IOC) in addition to an intelligent network switch being developed jointly with Japanese carrier Nippon Telegraph and Telephone Public Corp. (NTT) under the code name "Asparagus" (see chart at right).

IOC strategy

The IOC will provide local distribution to personal computers and telephones on the user desk top. DG recognizes that the IOC is tackling a market where several digital private branch exchange (PBX) vendors, notably Northern Telecom, Inc., have come to grief, acknowledged Colin Crook, senior vice-president of DG's Communications Systems Group.

The company hopes to uncover where the real demand is for "tighter coupling of voice/data applications" Crook noted, refusing to elaborate.

The network switch will act as a gateway between users and resources on the local network and at remote sites, Crook said. It will be able to assign user transmissions on demand to either circuit-switched or packet-switched networks and will act as a gateway between different types of networking environments, such as IBM's Systems Network Architecture and the Open Systems Interconnect standard, he added. The switch will also support Integrated Services Digital Network (ISDN) protocols, Crook said.

DG seeks to differentiate its network switch from other T1 switches through integration with DG hosts, said Joseph Forgione, director of marketing for DG's communications division. The resulting hybrid will assume responsibility for administrative tasks such as usage monitoring and troubleshooting.

Is it too late?

"While DEC is busy trying to attach Macintoshes to VAXs," DG is developing a "mainframe-to-micro, wide-area network-to-local-area network, geographically dispersed system" that potentially could beat DEC at its own networking game, said Joseph Payne, an analyst at Baltimore investment firm Alex Brown & Sons, Inc. "The trouble is, it will take too long," Payne said.

DEC already is a strong presence in computer-based networking and is moving rapidly to integrate its hosts with various vendors' PBX systems, as well as with the seven regional Bell holding companies' central-office switches.

DG may also have a tough time convincing business customers it has successfully metamorphosed from computer company to switch vendor. "I doubt that a Citibank would turn to DG for a networking system that needs to be 99.9% reliable," one consultant said.

DG's Crook admitted, "People do ask us, 'Do you really understand [networking protocols such as] ISDN and SS7?' "

More than two years ago, DG began hiring and acquiring the telecommunications talent it lacked, Crook said. The alliances include the following:

- In 1985, DG acquired the Integrated Digital Network operation of United Technologies Corp. The IOC system will reportedly be based on a PBX product that the operation had previously developed.
- In February 1987, DG paid $28 million for Dama Telecommunications Corp., in Parsippany, N.J. The network service company is now part of DG's Rockville, Md., Network Services Division.
- DG recently became a reseller of Bridge Communications, Inc.'s network products and seeks similar agreements with vendors that sell other types of network products, Forgione said.
- In October 1987, DG formed a joint development agreement with NTT on the Asparagus intelligent network switch.

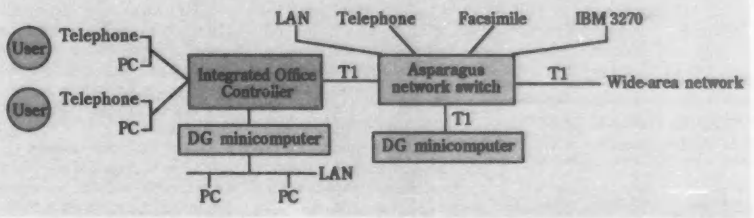
While DG plans to sell the network switch directly and through OEMs, NTT will be a major distributor of the product. DG hopes that European and U.S. carriers will also sell the system as a complement to their own networking services.

"We're designing the system so that it can be flexible in terms of where the networking intelligence lies — at the carrier's central office or on the customer's premise," Crook said.

DG's Crook

As DG sees it

Data General's plan will use computer/switch hybrids; Asparagus will connect local voice and data resources to wide-area networks, and Integrated Office Controllers will deliver applications to the desk top



CW CHART

Spectrum

FROM PAGE 1

sources Information Systems division of McDonnell Douglas Aircraft Co. in St. Louis. "The performance is, on the average, four times faster."

The HP Spectrum models have been a long time in coming. First discussed as far back as 1983 and formally unveiled in February 1986, the 32-bit machines are based on what was then seen as a radical architecture for a high-end minicomputer: reduced instruction set computing (RISC).

'Exceeds expectations'

An HP spokesman said the company does not divulge shipment levels on individual systems but that 930 and 950 shipments to date have "exceeded our expectations." HP has an installed base of some 26,000 HP 3000 units worldwide.

Two years after their debut, Spectrum models are just beginning to show up in corporate data centers. The rollout was delayed for about a year when software I/O bugs were uncovered and HP found it necessary to streamline some overcomplicated code.

So far, according to users, HP's efforts have paid off. Because the Model 950's MPE XL operating system is compatible with the Series 70's MPE VE operating system, users can run code from the 70 on the 950 in compatibility mode without any alterations but without the performance benefits of the Model 950.

To take full advantage of the new architecture, applications only have to be recompiled, not rewritten, according to HP.

"There is a recompiling that you do to run in native mode, but it's easy to do," GE's Reffner confirmed. "As long as you adhere to Cobol 74 and just take source code over to the 950 and recompile it in native mode, you'll be fine."

Unexpected fees

Although the migrations have mostly gone as planned, some users did report a few unpleasant surprises.

Baltimore Aircoil Co., an air-conditioner manufacturer in Jessup, Md., found itself shelling out some $60,000 in unexpected software upgrade fees in order to run its Series 70 applications on the Model 950. The company had been running Ask Computer Systems, Inc.'s Materials Requirement Planning and Cognos, Inc.'s Powerhouse fourth-generation development language, among other applications, on its Series 70.

"We found when we moved to the 950, we had to pay an upgrade fee of $45,000 to Ask and $15,000 to Cognos, just to be able to run the same software on a different architecture," said Jack Sutkaytis, director of MIS at Baltimore Aircoil. "That's an awful lot of money we weren't expecting to pay just to run enhanced versions of their software."

"Our pricing structure is not a secret, and we aren't sneaking anything by anyone," said David Sohm, vice-president of marketing at Ask Computer. "We have a tiered-pricing structure based on the CPU the customer has."

Cognos' Powerhouse costs $30,450 for the Series 70 and $47,850 for the Model 950, according to Mike Laginski, marketing manager for Cognos' HP products. He said the cost of porting to the RISC architecture and performance advantages on the Model 950 justify the higher price.

Sutkaytis said Baltimore Aircoil was advised by consultants that it should upgrade the standard 32M bytes of memory of the Model 950 to 64M bytes to take full advantage of the architecture, and that "set us back another $50,000."

In addition, the Spectrum series does not support HP's older IBM 3270-compatible terminals, including the HP 2624A. "We had the option of installing some new chips into the terminals to make them work, but since the terminals were dispersed around the country, it was better to just replace them," Sutkaytis said.

Prefer Model 950

For the most part, HP shops said they are skipping the Model 930 in favor of the 950, which offers 6.7 million instructions per second (MIPS), compared with the 930's 4.5 MIPS. During the delays, HP promised its loyal customers the opportunity to upgrade from a Model 930 to a 950 at a minimal, or no, additional cost. Some users, however, said they are sticking with the 930, at least for now.

"We took the 930 because it was available first," said Jim Burns, vice-president and director of corporate data services at Houghton Mifflin Co. in Burlington, Mass. "We knew we could use it in the field when we need a 950 at headquarters."

Not everyone migrating to Spectrum will do so from an HP environment. The San Bernardino County (Calif.) Central Credit Union, for example, said it plans to convert from a Digital Equipment Corp. VAX-11/785 to a Model 950.

"Primarily, we're switching to the 950 because the software package we chose runs on it," explained Ken Facer, vice-president of the credit union. "The monthly maintenance costs on the HP were about half that of the 8700, and there's a much better secondary market for HP equipment than there is for the VAX."

Cullinet

FROM PAGE 1

next eight months must begin to generate new revenue in short order, or else drastic measures would be needed to prevent a snowballing loss of confidence.

Holding the key

Cullinet customers who use both IBM and DEC processors — approximately 60% of the customer base — may hold the key to the quick success or failure of the new offerings. *Computerworld* interviews with a sampling of customers revealed that most approved of Cullinet's bold strategy.

"Its software concepts are on the leading edge," said David Hale, director of materials and distribution at Racal-Milgo, Inc. in Miami.

Douglas Cook, business systems manager at Babcock & Wilcox-NNFD in Lynchburg, Va., said, "I think our future is pretty much VAX-oriented. . . . I see Cullinet as the only major software company that's really in line to go both ways, IBM or DEC."

However, such praise was often tempered by an acknowledgment of the magnitude of Cullinet's task, and few customers said they were currently ready to put their money down on a VAX product from the Westwood, Mass., firm.

Cullinet "has got an awfully big job on its hands — and a tough one," said Melvin Stuckey, director of information systems at Jeppeson Sanderson, an aviation chart supplier in Englewood, Colo.

"In some ways, Cullinet's view is a little too wide, like it is looking for each and every opportunity," said Jerry Peters, senior vice-president of information services at Exchange National Bank of Chicago.

Cullinet has a new supporter in its comeback attempt. DEC has made it clear that it views a recovered Cullinet as a potential ally in its own competition with IBM. Although IDMS/SQL will compete with DEC's relational data base, RDB, DEC officials said they see the product as the precursor to Cullinet's conversion of its mainframe applications to the VAX (see story below).

"The bottom line is, we're pretty bullish on Cullinet," said William M. Steul, DEC's corporate systems vice-president.

But some observers still see little to be bullish about. Cullinet founder John J. Cullinane, who told *Computerworld* five years ago, "Our strength is that we have no weaknesses," abruptly returned to the company from a short-lived retirement this month to help combat a formidable array of setbacks.

Cullinet has been losing money since the start of fiscal 1986, and it is touch and go as to whether it will return to profitability by April 30, the end of its fourth quarter for this year. Cullinet's stock dropped 3¼ points to 7⅜ in the Oct. 19 crash, off a high of 14⅛ in September, and has yet to recover. It was hovering around 7½ last week.

Cullinet still gets about 60% of its revenue from its mainframe DBMS, IDMS/R. That is an improvement over its 99% dependence on IDMS/R six years ago, but it still leaves the company vulnerable to damage from IBM's DB2.

There are even signs that Cullinane's abrupt return as vice-chairman, looking over the shoulder of the management team he named before he left, has caused unease within the company.

When Cullinane agreed to provide a background interview for this story without any other employees being present, one company official called *Computerworld* to find out what Cullinane had said.

Coming attractions

To further improve its product mix, Cullinet executives said, the company will make the following moves during the next eight months:

- The April 5 release of IDMS/SQL will coincide with enhancements to another product, Knowledgebuild, a VAX-based application generator that has been available since January. After the IDMS/SQL introduction, Knowledgebuild will be able to use IDMS/SQL files as well as DEC RMS files.

  It will also incorporate an expert system, added with Cullinet's own Application Expert product, to help programmers build applications and allow them to embed an expert system in an application.
- It will introduce a version of the Application Expert expert system-building shell that allows users to embed expert systems in their IDMS/R applications. Application Expert/IDMS is now in beta testing.
- Cullinet will launch a consumer banking system, to be priced in the range of $2 million, built on the IDMS/R data base and including all the Cullinet tools, including Application Expert, embedded in it, according to James Fox, Cullinet's banking vice-president.

  The software will function as "both an application and an overarching environment" that will let users "build [consumer banking] products pretty quickly, online, real-time and tailored to the bank," Fox said. Banking software is a high-priced product, and Cullinet's line is coming out at a time when other vendors have yet to succeed in the market in any major way.

  Cullinet's banking software has been installed at a handful of beta-test sites since mid-1987, and it has been a big hit at at least one site — the Exchange National Bank.

  "It's a vastly superior design," the bank's Peters said. "It's not like any other system on the market."

Building blocks best

Peters said Exchange National reviewed packages from such well-established software vendors as Hogan Systems, Inc. and the former Uccel Corp. But the Cullinet approach, which Peters termed a building block method, was best suited to the bank's needs.

Overall, Cullinet is betting on an ambitious strategy that it calls its "3X3 architecture." Three-by-three is shorthand for three main product lines running across three hardware platforms: integrated data base, applications and programming tools on mainframe, VAX and microcomputer platforms.

An even more ambitious strategy, still unannounced but under development and scheduled to be released in the next two years, envisions an applications environment centered on a server-type distributed data base and tied together by SQL, said David Litwack, Cullinet executive vice-president of systems products.

For example, IDMS/Architect, a personal computer-based tool for designing applications that will run on mainframes, VAXs or PCs, will be integrated with Knowledgebuild to form an application-building system that spans the development steps from front-end design to final debugging, Litwack claimed.

Gaining mobility

Such an application-building system would be able to take advantage of the cross-platform mobility of SQL commands and build them into distributed applications.

"It'll be able to go everywhere — not only to all Cullinet data bases but to many SQL-based data bases outside the Cullinet environment," Litwack said.

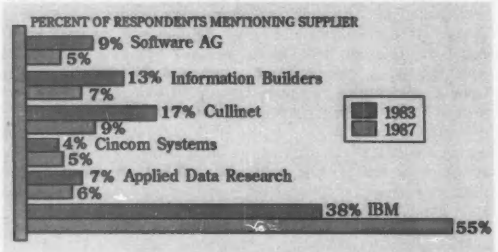
Regardless of long-range plans, Cullinet must make its move into the VAX market pay off in the short run.

The move toward the VAX may win the company praise from Wall Street, which views DEC as a winner, but the sampling of Cullinet customers turned up few with plans to buy IDMS/SQL at this point.

"We're not really giving [IDMS/SQL] any consideration,

Buying intentions shift to IBM

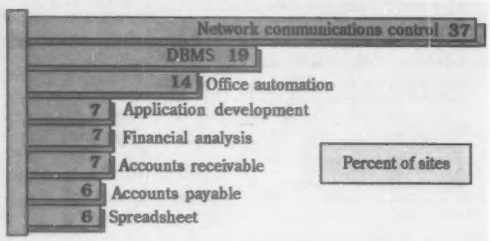
Since the introduction of DB2, mainframe data base management system users have put more money into IBM relational products



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

Data base management system distant second

Network control tops shopping list with DBMS second in a survey of 11,500 commercial DEC VAX users' software buying intentions



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DEC alliance builds quietly

Nine months after the announcement of a feasibility study for a possible joint development effort, not much seems to be happening in the on-again, off-again DEC and Cullinet alliance.

Through two companies acquired last year — Applied Development Corp. and Distribution Management Systems, Inc. — Cullinet Software, Inc. became a Digital Equipment Corp. cooperative marketing partner. Nevertheless, rumors persist, encouraged by DEC and Cullinet themselves, that there is something brewing beyond a standard marketing relationship.

Cullinet Chairman David L. Chapman said earlier this month that the DEC alliance "is moving right along." Some "technical questions have been worked out, and we're going on to the next step," he added.

"We see Cullinet as a very viable partner, in the loose sense of the word, over a long time; and we're very hopeful that they do well," said DEC's corporate systems vice-president, William M. Steul. "We wish them the best of luck and have offered to help them in any way that we can."

At least some measure of help is already being given: Both companies confirmed that a DEC development employee is currently enjoying office privileges at Cullinet and a Cullinet employee at DEC, with an eye toward facilitating a future relationship, whatever form it takes. The form it is most likely to take is that of an alliance to target a DEC VAX-based version of Cullinet's banking system at the banking industry.

Cullinet Executive Vice-President John Landry ruled out several application areas for potential cooperation between DEC and Cullinet; two he declined to rule out were computer-assisted software engineering and banking.

"DEC is extraordinarily interested in banking," Landry noted, "and their gear is well suited to banking's distributed environment." Two forthcoming DEC products — the 8800 series and VMS Version 5, "which will include multiprocessing capabilities" — are likely to increase DEC's appetite for the banking market.

"DEC clearly doesn't want to just play in the departmental market any more," Landry said. "It wants the whole game."

"We're having ongoing discussions with Cullinet regarding banking," Steul said. "Both of us see good reasons to develop products, and there is still the chance that we could co-develop products."

NELL MARGOLIS

because DEC's own products are adequate to our needs. We have 25-odd data bases built using RDB," said Michael Johnson, VAX systems manager at Du Pont Co. in Brevard, N.C.

An MIS manager for a Southeastern electric utility said, "We're an [IBM] VM environment. We keep our data base on the mainframe and our office systems application on the VAX," and each will remain in its own sphere.

Jeppesen Sanderson's Stuckey, another user of IBM and DEC equipment, said he sees a need for IDMS/SQL even if he has no immediate plans to purchase it.

Cullinet is "really addressing the heart of our business with IDMS/SQL," Stuckey said. "It would be nice to go to one hardware system eventually, and we're glad Cullinet will be there for us if we do."

Tough market to crack

But no matter how technically promising IDMS/SQL proves to be, it is a latecomer in a crowded market. VAX users are already served by not only DEC and such entrenched third-party suppliers as Relational Technology, Inc., Informix, Inc. and Sybase, Inc. but also Oracle Corp., whose marketing pizzazz often evokes comparisons to the early Cullinet.

"It's unfortunate that Cullinet is entering [the VAX market] the same way it has entered every other market — by buying an incompatible piece of software," said Peter Tierney, vice-president of marketing at Belmont, Calif.-based Oracle.

"There have been times when I've been worried about the competitive threat posed by a company entering this market," said Gary Morgenthaler, chairman of Relational Technology. "This isn't one of them."

Customer loyalty

Doubts notwithstanding, Cullinet customers who were contacted remain surprisingly loyal to the company during its troubled times.

"We're committed to the three-by-three architecture that Cullinet is planning," said Gus Chicola, data base administrator at the County of Metro Dade Office of Computer Services in Miami, an IDMS/SQL beta-test site. "Cullinet has enough invested in it — and we have too much invested in it — to turn around and say, 'OK, let's go to another company right now.' "

Even some Wall Street analysts said that they are willing to give Cullinet the benefit of the doubt. "I anticipate that they'll make a profit in the fourth quarter of '88 — but that's not the issue," said Rick Sherlund, an analyst at Goldman, Sachs & Co. "The issue is, let's get the products out the door and see how they do."

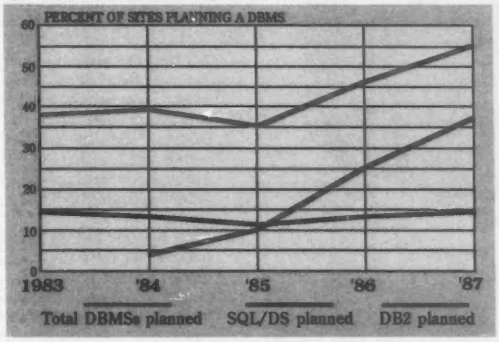
Cullinet has enough cash to continue losing money for a while, and revenue has continued to grow even as the company entered its losing quarters, Sherlund noted.

A return to profitability "is an absolute must for users who are thinking of Cullinet as their strategic partner in an MIS structure. They have to prove that they're an ongoing entity," warned Robert Anderson, an analyst at Sutro & Co. in San Francisco.

"I'd be foolish to say that we're not cognizant of Cullinet's [unprofitable streak] or that we're not concerned," Chicola said. "But we have had many discussions with Cullinet executives and have come away feeling that our faith in the company was well placed. Now, it had better play ball."

DB2 drives IBM's improving market share

DB2 and SQL/DS gave IBM 55% of total data base management system purchases planned at year-end 1987



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

Users consider options

There is no such thing as a typical Cullinet customer, but the comments of users interviewed by *Computerworld* touched on a number of common concerns.

Fourteen users surveyed said they are managing environments with a mixture of IBM and Digital Equipment Corp. hardware or expect to be doing so soon. Although Cullinet Software, Inc. wants to find new customers with its DEC VAX product lines, its existing mixed-vendor customer base represents one of the few available sounding boards for its corporate strategy.

Despite Cullinet's recent financial troubles, users said they are generally optimistic about the company's prospects, and most applauded the firm's effort to provide a relational data base management system on the VAX. "Cullinet, like other vendors, is absolutely correct in addressing other platforms," said James Warenda, manager of data base administration at the Public Service Co. of New Hampshire.

"It's very exciting, what they're doing," said David Hale, director of materials and distribution at Racal-Milgo in Miami. Hale expressed interest in Cullinet's VAX-based IDMS/SQL relational DBMS despite the fact that his company is not currently a VAX site.

For Gus Chicola, data base administrator at the County of Metro Dade Office of Computer Services in Miami, which is serving as a beta-test site for IDMS/SQL, the prospect of a VAX data base that might be able to work with Cullinet's IDMS/R holds particular allure. "IDMS/SQL is a strategic tool in our eyes," he said. "What if we have a department that is using VAXs and it needs information that's in IDMS/R on the mainframe? The future compatibility of IDMS/SQL with IDMS/R is certainly an attraction." Cullinet has committed itself to providing full SQL support in IDMS/R Version 11.

User response to Cullinet's direction, however, was not uniformly enthusiastic. Robert Curran, executive director of computer services at Tufts University in Massachusetts, said he supports the company's agenda, but he cautioned that Cullinet "needs to maintain a close contact with the customer base."

Product offerings won high marks, and although many users raised concerns regarding the company's long string of unprofitable quarters, most said they feel that panic at this point would be premature. "Profit and loss statements don't tell you everything about a company," Curran said.

"Profit worry? No," Racal-Milgo's Hale said. "I think Cullinet has a very good product line, and that's what counts in the long run."

ROSEMARY HAMILTON and NELL MARGOLIS

Must Software pumps up Nomad with referential integrity

BY ALAN ALPER
CW STAFF

NORWALK, Conn. — Must Software International last week broadly enhanced its recently acquired Nomad fourth-generation language and data base management system, adding support for referential integrity and cooperative processing.

Must also announced two add-on modules for Version 4.50 of Nomad, which runs on IBM mainframes. The two add-ons are a performance analyzer, said to monitor and record machine resources consumed by Nomad applications, and a session manager, which reportedly allows multiple Nomad users and applications to run in a single address space under IBM's MVS operating system, thus eliminating the overhead of TSO.

As expected [CW, Oct. 26, 1987], Nomad's referential integrity is implemented by entering rules into a schema or data dictionary. The rules specify relationships among data elements in tables in a relational DBMS and are applied whenever the elements are modified.

Applications developed using Nomad will also have referential integrity when run against other SQL-based DBMSs, such as IBM's DB2, noted Frank Fish, Must's executive vice-president.

Data consistency

The new release will generate all the SQL statements needed to ensure that data modified in one table will also be changed in related data in another table, Fish explained. Nomad's SQL interfaces have also been enhanced.

Cooperative processing support enables developers to allocate portions of a Nomad application to a mainframe and other parts to a personal computer or to multiple microcomputers.

Communications facilities let applications share record-level dialogues among the different processors. Must's micro version of Nomad, PC Nomad, and a version for Digital Equipment Corp.'s VAXs are also scheduled to support cooperative processing when they are released in April and July, respectively.

With the Nomad Session Manager, access to Nomad is available directly through VTAM under MVS. Because Nomad no longer needs to reside in the TSO region, response time for users on the system is improved, Fish said. Pricing is based on processor size and ranges from $17,000 to $25,000.

Using the Nomad Application Performance Analyzer, an experienced Nomad developer can increase application performance by as much as 80%, Fish said. Prices for the performance analyzer, which runs on both MVS- and VM-based systems, range from $7,000 to $15,000, based on machine size.

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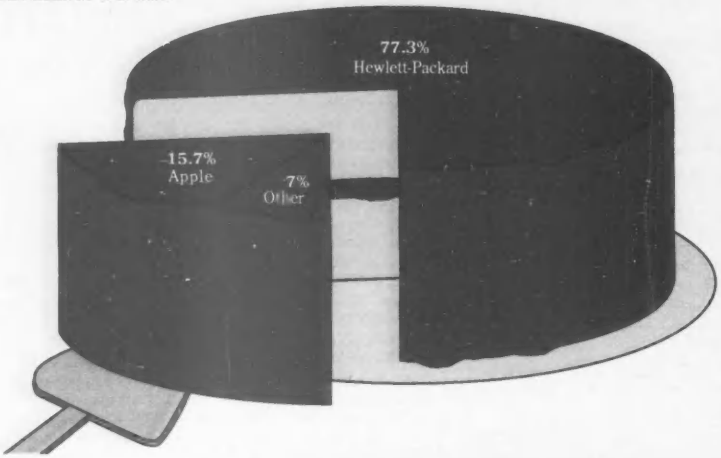
TRENDS

PC printers

HP takes the cake in the laser market

MARKET SHARE BY UNIT SALES



Apple Computer, Inc. came in second not once but twice in last year's race for printer dominance.

The firm ran a distant second to Epson America, Inc. in the impact printer market and an even more distant second to Hewlett-Packard Co. in the laser printer market.

Epson had a 31.8% share of units and a 31.2% share of all money spent in this market.

Even Apple, known mostly as a desktop computer vendor, nipped IBM in the impact market. Apple had 17.5% of the total dollars spent, while IBM, with its popular Proprinter series, had 16.9%. The retail channel pumped 1.4 million impact printers into the market last year, far outstripping shipments of laser printers.

The laser printer market, a bit more monopolistic, was captured by HP, which held 77.3% of all units sold. A recent announcement that HP will support Adobe Systems, Inc.'s Postscript page description language may add to the firm's share as well.

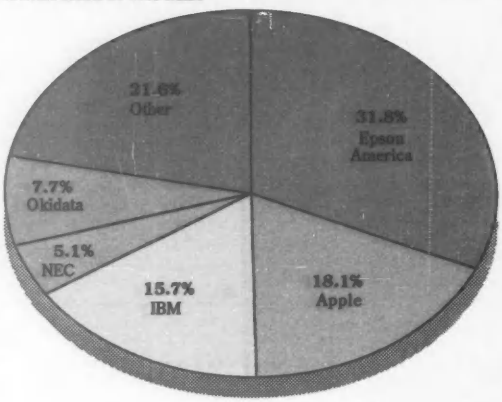
But there is hope for HP competitors, as this market nearly tripled in size over the course of the year. Unit sales of laser printers grew from 30,734 in the first quarter to 89,025 in the fourth quarter. Total unit sales hit 227,589.

Much of this growth is due to lower prices and the rapid rise of the desktop publishing market, which relies on laser printers for the output of gussied-up documents.

DOUGLAS BARNEY

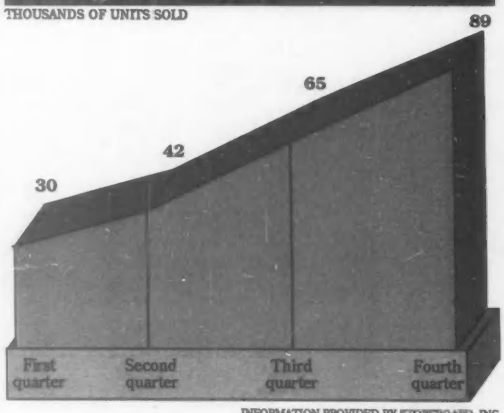
Impact printers

MARKET SHARE BY UNIT SALES



Laser growth in 1987

THOUSANDS OF UNITS SOLD



INFORMATION PROVIDED BY STORAGEBOARD, INC.
CW CHARTS: AMY J. SWANSON

INSIDE LINES

Mark the calendar. IBM is planning a major rollout in June that will see "multiple" Personal System/2 announcements, Intel 80386-based systems and upgrades, according to sources. The company is planning to invite about 4,000 people, mostly dealers, to a two-day event in Dallas at which IBM President John Akers will make the keynote address.

Shades raised in Moscow. Glasnost reached the computer industry this week as Microsoft reportedly made an agreement in principle with USSR-based Dialog, which will act as exclusive distributor of MS-DOS in the Soviet Union, sources said.

KGB in Armonk? A poster plastered at IBM's headquarters aims to keep employees looking over their shoulders: "Do you know the person behind you?"

Stating the obvious. Invitations went out late last week for the official debut of the Sun Microsystems low-end workstation, which will be based on the 80386 microprocessor. After dozens of mentions in the press and months of speculation, it would seem the April 6 press event will be anticlimactic. But Sun is being a good sport. On the envelope that contained the invitation was the phrase "We know you know it's a 386."

Bench wars. Sybase has fired the opening salvo in what may become the war of the benchmarks. It launched an upgraded version of its relational data base management system that doubles its transaction throughput capability. Release 3.0 is accompanied by a standard TP1 benchmark, vouched for by an independent performance evaluator, that shows 29.3 transactions per second on a DEC VAX 8700. Cullinet is set to announce next week its VAX product, IDMS/SQL, which the firm says it plans to market on a transaction processing basis with its own benchmark results. Oracle plans to introduce a transaction processing facility later this year but has shied away from benchmarks.

Paradox goes naked. Borland International will reportedly release a bare-bones version of its Paradox data base this year that is designed to let developers write applications in a variety of Borland languages, including Prolog, Turbo C, Turbo Pascal and Turbo Basic. The package will feature only Paradox's 200K-byte data processing engine and the program's Query By Example module.

Done deals. The shroud of uncertainty over the future of Migent's Emerald Bay DBMS was lifted last week as Ashton-Tate settled a suit that it had filed against Migent and Emerald Bay author Wayne Ratliff (previously Ashton-Tate's lead developer for Dbase) more than a year ago. Details on the settlement were not disclosed, but the $695 Emerald Bay data base engine and server began shipping without a fully Dbase-compatible language, as originally intended; the company does offer, however, the $495 Eagle, a data base language resembling Dbase.

Easy payment terms. The current television commercial touting General Motors Acceptance Corp.'s (GMAC) financing for boats and homes as well as cars may soon be able to add a new segment — professional computer services. GM's Electronic Data Systems (EDS) subsidiary is exploring the option of offering GMAC financing for EDS services, Input analyst Bob Goodwin said at an ADAPSO conference session.

He's at it again. High-tech corporate raider Asher B. Edelman's latest target appears to be Centel Corp., a Chicago-based vendor of local telephone exchange systems, communications systems and cable TV services. Edelman, in partnership with New York cellular telephone vendor Metro Mobile CTS, last week announced a proxy fight to place three nominees on Centel's 10-member board.

"Just what I wanted," the news editor purred after his switchboard started lighting up. So keep tipping us off to those impending cat fights by calling Pete Bartolik at the CW hot line, 800-343-6474 (or 617-879-0700), and curl up for a chat.

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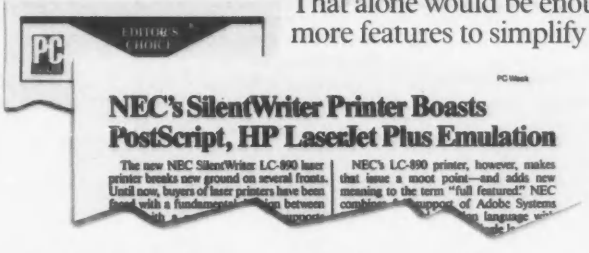
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EDITOR'S CHOICE
PC Week
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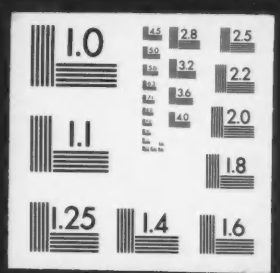
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